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TVAAGCPDQSPQLPWNPGHDQDHHVHIGQGKTLTSSATVYSIHISEGGKLVIKDHD
EPIVLRTRHILIDNGGELHAGSALCPFQGNFTIILYGRADEGIQPDPPYGLKYIGVGKG
GALELHGQKKLSWTFNLKTLHPGGMAEGGYFFERSWGHARGVIVHVIDPKSGTVIHSDF
DTYRSKKESERLVQYLNAVDPGRILSVAVNDEGSRLDDMARKAMTKLGSKHFLHLGFR
HPWSFLTIVKGNPSSSVEDHIEYHGHRGSAAARVFKLFQTEHGEYFNVSLSSSEWQDVEW
TEWFDHDKVSQTKGGEKISDLWKAHPGKICNRPIDIQATTMDGVNLSTEVVYKKGQDYR
FACYDRGRACRSYRVRFLCGKPVPRKLTVTIDTNVNSTILNLEDNVQSWKPGDTLVIAS
TDYSMYQAEFQVLPCRSCAPNQVKVAGKPMYHIGEEIDGVDMAEVLGSLSRNIIVMG
EMEDKCYPRNHCNFFDFDTFGGHIKFALGFKAHLEGTELKHMGGQLVGQYPIHFHL
AGDVDERGGYDPPTYIRDLSIHHTFSRCVTVHGSNGLLIKDVVGYNLGHCFETEDGPE
ERNTFDHCLGLLVKSGTLLPSDRDSKMCKMITEDSYPGYIPKPRQDCNAVSTFWMANPN
NNLINCAAAGSEETGFWFIFHHVPTGPSVGMYSYSEHIPLGKFYNNRAHSNYRAGMI
IDNGVKTTEASAKDKRPFLSIISARYSPHQDADPLKPREPAIRHFIAYKNQDHGAWLR
GGDVWLDSCRFAENGIGLTLASGGTFPYDDGSKQEIKNLFLVGESGNVGTMMNDNRIWG
PGGLDHSGRTLPIGQNFPIRGIQLYDGPINIQNCTFRKFVALEGRHTSALAFRLNNAWQ
SCPHNNVTGIAFEDVPITSRVFFGEPGPWFNQLDMDGDKTSVFHDVDGSVSEYPGSYLT
KNDNWLVRHPDCINVPDWRGAICSGCYAQMYIQAYKTSNLRMKIKNDFPSHPLYLEGA
LTRSTHYQQYQPVVTLQKGYTIHWDQTAPAEALIWLINFNKGDWIRVGLCYPRGTTFSI
LSDVHNRLKQTSKTGVFVRTLQMDKVEQSYPGRSHYYWDEDSGLLFLKLKAQNERKEF
AFCSMKGCERIKIKALIPKNAGVSDCTATAYPKFTERAVVDVPMPPKLFQSGQLKTKDHF
LEVKMESSKQHFFHLWNDFAFIEVDGKKYPSEDGIQVVVIDGNQGRVVSHTSFRNSIL
QGI PWQLFNYVATIPDNSIVLMASKGRYVSRGPWTRVLEKLGADRGLKLKEQMAFVGFK
GSFRPIWVTLDTEDEHKAKIFQVVPIPVVKKKKL

Fig. 1A

Amino acid sequence of secreted ColoUp1 protein (I)
(SEQ ID NO: 1)

AGCPDQSPQLQPNPGHDQDHHVHIGQGKTLTLLTSSATVYSIHISEGGKLVIKDHDEPI
 VLRTRHILIDNGGELHAGSALCPFQGNFTIILYGRADEGIQPDPPYGLKYIGVGKGGAL
 ELHGQKKLSWTFLNKTFLHPGMAEGGYFFERSWGHARGVIVHVIDPKSGTVIHSDRFDTY
 RSKKESERLVQYLNAPVDGRILSVAVNDEGSRNLDDMARKAMTKLGSKHFLHLGFRHPW
 SFLTVKGNPSSSVEDHIEYHGHRGSAAARVFKLFQTEHGEYFNVSLSSEWVQDVEWTEW
 FDHDKVSQTKGGEKISDLWKAHPGKICNRPIDIQATTMDGVNLSTEVVYKKGQDYRFAC
 YDRGRACRSYRVRFCLCGKPVRPKLTVTIDTNVNSTILNLEDNVQSWKPGDTLVIASDY
 SMYQAEFQVLPCRSCAPNQVKVAGKPMYLIHIGEEIDGVDMAEVGLLSRNIIVMGEME
 DKCYPYRNHICNFFDFTFGGHIKFALGFKAHLEGTELKHMGGQQLVGQYPIHFHLAGD
 VDERGGYDPPTYIRDLSIHHTFSRCVTVHGSNGLLIKDVVGYNLSLGHCFFTEDGPPEERN
 TFDHCLGLLVKSGTLLPSDRDSKMCKMITEDSYPGYIPKPRQDCNAVSTFWMANPNNNL
 INCAAAGSEETGFWFIFHHVPTGPSVGMYSYSEHIPLGKFYNNRAHSNYRAGMIIDN
 GVKTTTEASAKDKRPFLSIISARYSPHQDADPLKPREPAIRHFIAAYKNQDHGAWLRGGD
 VWLDSRCFADNGIGLTLASGGTFPYDDGSKQEIKNSLFVGESGNVGTMMMDNRIWGPGG
 LDHSGRTLPIGQNFPIRGIQLYDGPINIQNCTFRKFVALEGRHTSALAFLNNAWQSCP
 HNNVTGIAFEDVPITSRVFFGEPGPWFNQLDMDGDKTSVFHDVDGSVSEYPGSYLTKND
 NWLVRHPDCINVPDWRGAICSGCYAQMYIQAYKTSNLRMKIKNDFPSHPLYLEGALTR
 STHYQQYQPVVTLQKGYTIHWDQTAPAEALAIWLINFNKGDWIRVGLCYPRGTTFSILSD
 VHNRLKQTSKTGVFVRTLQMDKVEQSYPGRSHYYWDEDSGLLFLKLKAQNEREKFAFC
 SMKGCEKIKALIPKNAGVSDCTATAYPKFTERAVVDVPMKKLFGSQLKTKDHFLEV
 KMESSKQHFFHLWNDFAYIEVDGKKYPSSSEDGIQVVVIDGNQGRVVSHTSFRNSILQGI
 PWQLFNYVATIPDNSIVLMASKGRYVSRGPWTRVLEKLGAADRGLKLKEQMAFVGFKGSF
 RPIWVTLDTEHAKAKIFQVVPPIPVVKKKKL

Fig. 1B

Amino acid sequence of secreted ColoUp1 protein (II)
 (SEQ ID NO: 2)

LQEVHVSKEITIGKISAASKMMWCSAAVDIMFLLDGSNSVGKGSFERSKHFAITVCDGLD
ISPERVRVGAFQFSSTPHLEFPLDSFSTQQEVKARIKRMVFKGGRTETELALKYLLHRG
LPGGRNASVPQILIIIVTDGKSQGDVALPSKQLKERGVTVFAVGVRFPWRWELHALASEP
RGQHVLLAEQVEDATNGLFSTLSSSAICSSATPDCRVEAHPCEHRTLEMVREFAGNAPC
WRGSRRTLAVLAAHCPFYSWKRVFLTHPATCYRTTCPGPCDSQPCQNGGTCVPEGLDGY
QCLCPLAFGGEANCALKLSLECRVDLLFLLDSSAGTTLDGFLRAKVFKRFVRAVLSED
SRARVGVATYSRELLVAVPVGEYQDVPDLVWSLDGIPFRGGPTLTGSALRQAAERGFGS
ATRTGQDRPRRVVLLTESHSEDEVAGPARHARARELLLLGVGSEAVRAELEETGSPK
HVMVYSDPDLEFNQIPELQGKLCRQRPGCRTQALDLVFMLDTSASVGPENFAQMOSFV
RSCALQFEVNPDVTQVGLVVYGSQVQTAFGLDTKPTRAAMLRAISQAPYLGGVGSAGTA
LLHIYDKVMTVQRGARPGVPKAVVVLTGGRGAEDAAVPAQKLNNNGISVLVVGVPVLS
EGLRRLAGPRDSLIVHVAAYADLRYHQDVLI EWLCGEAKQPVNLCCKPSPCMNEGSCVLQN
GSYRCKCRDGWEGPHCENRFLRRP

Fig. 2
Amino acid sequence of secreted ColoUp2 protein
(SEQ ID NO: 3)

CGTGACACTGTCTCGGCTACAGACCCAGAGGGAGCACACTGCCAGGATGGGAGCTGCTG
 GGAGGCAGGACTTCCTCTTCAAGGCCATGCTGACCATCAGCTGGCTCACTCTGACCTGC
 TTCCCTGGGGCCACATCCACAGTGGCTGCTGGGTGCCCTGACCAGAGCCCTGAGTTGCA
 ACCCTGGAACCCTGGCCATGACCAAGACCACCATGTGCATATCGGCCAGGGCAAGACAC
 TGCTGCTCACCTCTTCTGCCACGGTCTATTCCATCCACATCTCAGAGGGAGGCAAGCTG
 GTCATTAAAGACCACGACGAGCCGATTGTTTTTGCGAACCCGGCACATCCTGATTGACAA
 CGGAGGAGAGCTGCATGCTGGGAGTGCCCTCTGCCCTTTCCAGGGCAATTTCCACCATCA
 TTTTGTATGGAAGGGCTGATGAAGGTATTGAGCCGGATCCTTACTATGGTCTGAAGTAC
 ATTGGGGTTGGTAAAGGAGGCGCTCTTGAGTTGCATGGACAGAAAAAGCTCTCCTGGAC
 ATTTCTGAACAAGACCCTTCACCCAGGTGGCATGGCAGAAGGAGGCTATTTTTTTTGAAA
 GGAGCTGGGGCCACCGTGGAGTTATTGTTTATGTCATCGACCCCAATCAGGCACAGTC
 ATCCATTCTGACCGGTTTGACACCTATAGATCCAAGAAAGAGAGTGAACGTCTGGTCCA
 GTATTTGAACGCGGTGCCCGATGGCAGGATCCTTTCTGTTGCAGTGAATGATGAAGGTT
 CTCGAAATCTGGATGACATGGCCAGGAAGGCGATGACCAATTGGGAAGCAAACACTTC
 CTGCACCTTGGATTTAGACACCCCTTGGAGTTTTCTAACTGTGAAAGGAAATCCATCATC
 TTCAGTGGAAGACCATATTGAATATCATGGACATCGAGGCTCTGCTGCTGCCCGGGTAT
 TCAAATTGTTCCAGACAGAGCATGGCGAATATTTCAATGTTTTCTTTGTCCAGTGAGTGG
 GTTCAAGACGTGGAGTGGACGGAGTGGTTCGATCATGATAAAGTATCTCAGACTAAAGG
 TGGGGAGAAAATTTCCAGACCTCTGGAAAGCTCACCCAGGAAAAATATGCAATCGTCCCA
 TTGATATACAGGCCACTACAATGGATGGAGTTAACCTCAGCACCGAGGTTGTCTACAAA
 AAAGGCCAGGATTATAGGTTTGCTTGCTACGACCGGGGCAGAGCCTGCCGGAGCTACCG
 TGTACGGTTTCCTCTGTGGGAAGCCTGTGAGGCCCAAACCTCACAGTCACCATTGACACCA
 ATGTGAACAGCACCATTCTGAACTTGGAGGATAATGTACAGTCATGGAAACCTGGAGAT
 ACCCTGGTCATTGCCAGTACTGATTACTCCATGTACCAGGCAGAAGAGTTCCAGGTGCT
 TCCCTGCAGATCCTGCGCCCCCAACCAGGTCAAAGTGGCAGGGAAACCAATGTACCTGC
 ACATCGGGGAGGAGATAGACGGCGTGGACATGCGGGCGGAGGTGGGGCTTCTGAGCCGG
 AACATCATAGTGATGGGGGAGATGGAGGACAAATGCTACCCCTACAGAAACCATCTG
 CAATTTCTTTGACTTCGATACCTTTGGGGGCCACATCAAGTTTGCTCTGGGATTTAAGG
 CAGCACACTTGGAGGGCACGGAGCTGAAGCATATGGGACAGCAGCTGGTGGGTGAGTAC
 CCGATTCACTTCCACCTGGCCGGTGTGATGTAGACGAAAGGGGAGGTTATGACCCACCCAC
 ATACATCAGGGACCTCTCCATCCATCATACTTCTCTCGCTGCGTCACAGTCCATGGCT
 CCAATGGCTTGTTGATCAAGGACGTTGTGGGCTATAACTCTTTGGGCCACTGCTTCTTC
 ACGGAAGATGGGCCGGAGGAACGCAAACTTTTGACCACTGTCTTGGCCTCCTTGTCAA
 GTCTGGAACCCTCCTCCCCTCGGACCGTGACAGCAAGATGTGCAAGATGATCACAGAGG
 ACTCCTACCCAGGGTACATCCCCAAGCCCAGGCAAGACTGCAATGCTGTGTCCACCTTC
 TGGATGGCCAATCCCAACAACAACCTCATCAACTGTGCCGCTGCAGGATCTGAGGAAAC
 TGGATTTTGGTTTATTTTTTCAACCACGTACCAACGGGGCCCCTCCGTGGGAATGTACTCCC
 CAGGTTATTTCAGAGCACATTCCACTGGGAAAATTCTATAACAACCGAGCACATTCCAAC
 TACCGGGCTGGCATGATCATAGACAACGGAGTCAAAACCACCGAGGCCTCTGCCAAGGA
 CAAGCGGCCGTTTCTCTCAATCATCTCTGCCAGATACAGCCCTCACCAGGACGCCGACC
 CGCTGAAGCCCCGGGAGCCGGCCATCATCAGACACTTCATTGCCTACAAGAACCAGGAC
 CACGGGGCCTGGCTGCGCGGCGGGGATGTGTGGCTGGACAGCTGCCGGTTTGCTGACAA
 TGGCATTTGGCCTGACCCTGGCCAGTGGTGGAACTTCCCGTATGACGACGGCTCCAAGC
 AAGAGATAAAGAACAGCTTGTTTGTGGCGAGAGTGGCAACGTGGGGACGGAAATGATG
 GACAATAGGATCTGGGGCCCTGGCGGCTTGGACCATAGCGGAAGGACCCTCCCTATAGG

Fig. 3
 Nucleic acid sequence of ColoUp1
 (SEQ ID NO: 4)

CCAGAATTTTCCAATTAGAGGAATTCAGTTATATGATGGCCCCATCAACATCCAAAAC
 GCACTTTCCGAAAGTTTGTGGCCCTGGAGGGCCGGCACACCAGCGCCCTGGCCTTCCGC
 CTGAATAATGCCTGGCAGAGCTGCCCCCATAACAACGTGACCGGCATTGCCCTTGAGGA
 CGTTCCGATTACTTCCAGAGTGTTCTTCGGAGAGCCTGGGCCCTGGTTCAACCAGCTGG
 ACATGGATGGGGATAAGACATCTGTGTTCCATGACGTCGACGGCTCCGTGTCCGAGTAC
 CCTGGCTCCTACCTCACGAAGAATGACAACCTGGCTGGTCCGGCACCCAGACTGCATCAA
 TGTTCCTCGACTGGAGAGGGGCCATTTGCAGTGGGTGCTATGCACAGATGTACATTCAAG
 CCTACAAGACCAGTAACCTGCGAATGAAGATCATCAAGAATGACTTCCCCAGCCACCTT
 CTTTACCTGGAGGGGGCGCTCACCAGGAGCACCCATTACCAGCAATACCAACCGGTTGT
 CACCCTGCAGAAAGGGCTACACCATCCACTGGGACCAGACGGCCCCCGCGAACTCGCCA
 TCTGGCTCATCAACTTCAACAAGGGCGACTGGATCCGAGTGGGGCTCTGCTACCCGCGA
 GGCACCACATTCTCCATCCTCTCGGATGTTTCACAATCGCTGCTGAAGCAAACGTCCAA
 GACGGGCGTCTTCGTGAGGACCTTGCGAGATGGACAAAGTGGAGCAGAGCTACCCTGGCA
 GGAGCCACTACTACTGGGACGAGGACTCAGGGCTGTTGTTTCTGAAGCTGAAAGCTCAG
 AACGAGAGAGAGAAGTTTGCTTTCTGCTCCATGAAAGGCTGTGAGAGGATAAAGATTAA
 AGCTCTGATTCCAAAGAACGCAGGCGTCAGTGACTGCACAGCCACAGCTTACCCCAAGT
 TCACCGAGAGGGCTGTCGTAGACGTGCCGATGCCCAAGAAGCTCTTTGGTTCTCAGCTG
 AAAACAAAGGACCATTCTTGGAGGTGAAGATGGAGAGTTCCAAGCAGCACTTCTTCCA
 CCTCTGGAACGACTTCGCTTACATTGAAGTGGATGGGAAGAAGTACCCAGTTCGGAGG
 ATGGCATCCAGGTGGTGGTGATTGACGGGAACCAAGGGCGCGTGGTGAGCCACACGAGC
 TTCAGGAACTCCATTCTGCAAGGCATACCATGGCAGCTTTTCAACTATGTGGCGACCAT
 CCCTGACAATTCCATAGTGCTTATGGCATCAAAGGGAAGATACGTCTCCAGAGGCCCAT
 GGACCAGAGTGCTGGAAAAGCTTGGGGCAGACAGGGGTCTCAAGTTGAAAGAGCAAATG
 GCATTTCGTTGGCTTCAAAGGCAGCTTCCGGCCCATCTGGGTGACACTGGACACTGAGGA
 TCACAAAGCCAAAATCTTCCAAGTTGTGCCCATCCCTGTGGTGAAGAAGAAGAAGTTGT
GAGGACAGCTGCCGCCCGGTGCCACCTCGTGGTAGACTATG

Fig. 3 continued.
 Nucleic acid sequence of ColoUp1
 (SEQ ID NO: 4)

GCCCCCTGGCCCGAGCCGCGCCCGGGTCTGTGAGTAGAGCCGCCCCGGGCACCGAGCGCT
 GGTGCGCGCTCTCCTTCCGTTATATCAACATGCCCCCTTTCCTGTTGCTGGAAGCCGTC
 TGTGTTTTCTGTTTTCCAGAGTGCCCCCATCTCTCCCTCTCCAGGAAGTCCATGTAAG
 CAAAGAAACCATCGGGAAGATTTTCACTGCGCAGCAAAATGATGTGGTGCTCGGCTGCAG
 TGGACATCATGTTTTCTGTTAGATGGGTCTAACAGCGTCGGGAAAGGGAGCTTTGAAAGG
 TCCAAGCACTTTGCCATCACAGTCTGTGACGGTCTGGACATCAGCCCCGAGAGGGTCAG
 AGTGGGAGCATTCAGTTTCACTTCCCTCATCTGGAATTTCCCCTTGGATTCATTTT
 CAACCAACAGGAAGTGAAGGCAAGAATCAAGAGGATGGTTTTTCAAAGGAGGGCGCACG
 GAGACGGAACCTTGCTCTGAAATACCTTCTGCACAGAGGGTTGCCTGGAGGCAGAAATGC
 TTCTGTGCCCCAGATCCTCATCATCGTCACTGATGGGAAGTCCCAGGGGGATGTGGCAC
 TGCCATCCAAGCAGCTGAAGGAAAGGGGTGTCACTGTGTTTGTGTGGGGGTGAGGTTT
 CCCAGGTGGGAGGAGCTGCATGCACTGGCCAGCGAGCCTAGAGGGCAGCACGTGCTGTT
 GGCTGAGCAGGTGGAGGATGCCACCAACGGCCTCTTCAGCACCTCAGCAGCTCGGCCA
 TCTGCTCCAGCGCCACGCCAGACTGCAGGGTCGAGGCTCACCCCTGTGAGCACAGGACG
 CTGGAGATGGTCCGGGAGTTTCGCTGGCAATGCCCCATGCTGGAGAGGATCGCGGCGGAC
 CCTTGCGGTGCTGGCTGCACACTGTCCCTTCTACAGCTGGAAGAGAGTGTTCCTAACCC
 ACCCTGCCACCTGCTACAGGACCACCTGCCCAGGCCCCCTGTGACTCGCAGCCCTGCCAG
 AATGGAGGCACATGTGTTCCAGAAGGACTGGACGGCTACCAAGTGCCTCTGCCCCGCTGGC
 CTTTGGAGGGGAGGCTAACTGTGCCCTGAAGCTGAGCCTGGAATGCAGGGTCGACCTCC
 TCTTCTGCTGGACAGCTCTGCGGGCACCCTCTGGACGGCTTCTGCGGGCCAAAGTC
 TTCGTGAAGCGGTTTTGTGCGGGCCGTGCTGAGCGAGGACTCTCGGGCCCGAGTGGGTGT
 GGCCACATACAGCAGGGAGCTGCTGGTGGCGGTGCCTGTGGGGGAGTACCAGGATGTGC
 CTGACCTGGTCTGGAGCCTCGATGGCATTCCCTTCCGTGGTGGCCCCACCCTGACGGGC
 AGTGCCTTGCGGCAGGCGGCAGAGCGTGGCTTCGGGAGCGCCACCAGGACAGGCCAGGA
 CCGGCCACGTAGAGTGGTGGTTTTGCTCACTGAGTCACACTCCGAGGATGAGGTTGCGG
 GCCAGCGCGTCACGCAAGGGCGCGAGAGCTGCTCCTGCTGGGTGTAGGCAGTGAGGCC
 GTGCGGGCAGAGCTGGAGGAGATCACAGGCAGCCCAAAGCATGTGATGGTCTACTCGGA
 TCCTCAGGATCTGTTCAACCAATCCCTGAGCTGCAGGGGAAGCTGTGCAGCCGGCAGC
 GGCCAGGGTGCCGGACACAAGCCCTGGACCTCGTCTTCATGTTGGACACCTCTGCCTCA
 GTAGGGCCCCGAGAATTTTGCTCAGATGCAGAGCTTTGTGAGAAGCTGTGCCCTCCAGTT
 TGAGGTGAACCTGACGTGACACAGGTGCGCCTGGTGGTGTATGGCAGCCAGGTGCAGA
 CTGCCTTCGGGCTGGACACCAAAACCCACCCGGGCTGCGATGCTGCGGGCCATTAGCCAG
 GCCCCCTACCTAGGTGGGGTGGGCTCAGCCGGCACCGCCCTGCTGCACATCTATGACAA
 AGTGATGACCGTCCAGAGGGGTGCCCGGCCTGGTGTCCCCAAAGCTGTGGTGGTGCTCA
 CAGGCGGGAGAGGCGCAGAGGATGCAGCCGTTCTTGCCCAAGCTGAGGAACAATGGC
 ATCTCTGTCTTGGTGCTGGGCGTGGGGCCTGTCTAAGTGAGGGTCTGCGGAGGCTTGC
 AGGTCCCCGGGATTCCCTGATCCACGTGGCAGCTTACGCCGACCTGCGGTACCACCAGG
 ACGTGCTCATTGAGTGGCTGTGTGGAGAAGCCAAGCAGCCAGTCAACCTCTGCAAACCC
 AGCCCGTGATGAATGAGGGCAGCTGCGTCTGCGAGAATGGGAGCTACCGCTGCAAGTG
 TCGGGATGGCTGGGAGGGCCCCCACTGCGAGAACCGATTCTTGAGACGCCCTTGAGGCA
 CATGGCTCCCGTGACAGGAGGGCAGCAGCCGTACCCCTCCCAGCAACTACAGAGAAGGCC
 TGGGCACTGAAATGGTGCCTACCTTCTGGAATGTCTGTGCCCCAGGTCTTAGAATGTC
 TGCTTCCCCGCGTGGCCAGGACCACTATTCTCACTGAGGGAGGAGGATGTCCCAACTGC
 AGCCATGCTGCTTAGAGACAAGAAAGCAGCTGATGTCAACCACAAACGATGTTGTTGAA
 AAGTTTTGATGTGTAAGTAAATACCACTTTCTGTACCTGCTGTGCCTTGTGAGGCTA

Fig. 4

Nucleic acid sequence of ColoUp2
 (SEQ ID NO: 5)

TGTCATCTGCCACCTTTCCCTTGAGGATAAACAAGGGGTCCTGAAGACTTAAATTTAGC
GGCCTGACG TTCCTTTGCACACAATCAATGCTCGCCAGAATGTTGTTGACACAGTAATG
CCCAGCAGAGGCCTTTACTAGAGCATCCTTTGGACGG

Fig. 4 continued.
Nucleic acid sequence of ColoUp2
(SEQ ID NO: 5)

GCAGAGCACAGCATCGTCTGGGACCAGACTCGTCTCAGGCCAGTTGCAGCCTTCTCAGCC
 AAACGCCGACCAAGGAAAACTCACTACCATGAGAAATTGCAGTGATTTGCTTTTGCCCTCC
 TAGGCATCACCTGTGCCATACCAGTTAAACAGGCTGATTCTGGAAGTTCTGAGGAAAAG
 CAGCTTTACAACAAATACCCAGATGCTGTGGCCACATGGCTAAACCCTGACCCATCTCA
 GAAGCAGAATCTCCTAGCCCCACAGACCCTTCCAAGTAAGTCCAACGAAAGCCATGACC
 ACATGGATGATATGGATGATGAAGATGATGATGACCATGTGGACAGCCAGGACTCCATT
 GACTCGAACGACTCTGATGATGTAGATGACACTGATGATTCTCACCAGTCTGATGAGTC
 TCACCATTCTGATGAATCTGATGAACTGGTCACTGATTTTCCCACGGACCTGCCAGCAA
 CCGAAGTTTTCACTCCAGTTGTCCCCACAGTAGACACATATGATGGCCGAGGTGATAGT
 GTGGTTTATGGACTGAGGTCAAAATCTAAGAAGTTTCGCAGACCTGACATCCAGTACCC
 TGATGCTACAGACGAGGACATCACCTCACACATGGAAAGCGAGGAGTTGAATGGTGCAT
 ACAAGGCCATCCCCGTTGCCCAGGACCTGAACGCGCCTTCTGATTGGGACAGCCGTGGG
 AAGGACAGTTATGAAACGAGTCAGCTGGATGACCAGAGTGCTGAAACCCACAGCCACAA
 GCAGTCCAGATTATATAAGCGGAAAGCCAATGATGAGAGCAATGAGCATTCCGATGTGA
 TTGATAGTCAGGAACTTTCCAAAGTCAGCCGTGAATTCCACAGCCATGAATTTACAGC
 CATGAAGATATGCTGGTTGTAGACCCCCAAAAGTAAGGAAGAAGATAAACACCTGAAATT
 TCGTATTTCTCATGAATTAGATAGTGCATCTTCTGAGGTCAATTAAAGGAGAAAAAAT
 ACAATTTCTCACTTTGCATTTAGTCAAAAGAAAAAATGCTTTATAGCAAAATGAAAGAG
 AACATGAAATGCTTCTTCTCAGTTTATTGGTTGAATGTGTATCTATTTGAGTCTGGAA
 ATAACATAATGTGTTTGATAATTAGTTTAGTTTGTGGCTTCATGGAACTCCCTGTAAAC
 TAAAAGCTTCAGGGTTATGTCTATGTTCACTCTATAGAAGAAATGCAAACCTATCACTGT
 ATTTTAATATTTGTTATTCTCTCATGAATAGAAATTTATGTAGAAGCAAACAAAATACT
 TTTACCCACTTAAAAAGAGAATATAACATTTTATGTCACTATAATCTTTTGTTTTTTAA
 GTTAGTGTATATTTGTTGTGATTATCTTTTGTGGTGTGAATAAATCTTTTATCTTGA
 ATGTAATAAGAATTTGGTGGTGTCAATTGCTTATTTGTTTTTCCCACGGTTGTCCAGCAA
 TTAATAAACATAACCTTTTTTACTGCCTAAAAA

Fig. 5
 Nucleic acid sequence of Osteopontin
 (SEQ ID NO: 6)

AAAGGGGCAAGAGCTGAGCGGAACACCGGCCCGTCGCGGCAGCTGCTTCACCCCTC
 TCTCTGCAGCCATGGGGCTCCCTCGTGGACCTCTCGCGTCTCTCCTCCTTCTCCAGGTT
 TGCTGGCTGCAGTGCGCGGCCTCCGAGCCGTGCCGGGCGGTCTTCAGGGAGGCTGAAGT
 GACCTTGAGGGCGGGAGGCGCGGAGCAGGAGCCCGGCCAGGCGCTGGGGAAAGTATTCA
 TGGGCTGCCCTGGGCAAGAGCCAGCTCTGTTTAGCACTGATAATGATGACTTCACTGTG
 CGGAATGGCGAGACAGTCCAGGAAAGAAGGTCACTGAAGGAAAGGAATCCATTGAAGAT
 CTTCCCATCCAAACGTATCTTACGAAGACACAAGAGAGATTGGGTGGTTGCTCCAATAT
 CTGTCCCTGAAAATGGCAAGGGTCCCTTCCCCCAGAGACTGAATCAGCTCAAGTCTAAT
 AAAGATAGAGACACCAAGATTTTCTACAGCATCACGGGGCCGGGGGCAGACAGCCCCC
 TGAGGGTGTCTTCGCTGTAGAGAAGGAGACAGGCTGGTTGTTGTTGAATAAGCCACTGG
 ACCGGGAGGAGATTGCCAAGTATGAGCTCTTTGGCCACGCTGTGTGTCAGAGAATGGTGCC
 TCAGTGGAGGACCCCATGAACATCTCCATCATCGTGACCGACCAGAATGACCACAAGCC
 CAAGTTTACCCAGGACACCTTCCGAGGGAGTGTCTTAGAGGGAGTCTTACCAGGTACTT
 CTGTGATGCAGGTGACAGCCACGGATGAGGATGATGCCATCTACACCTACAATGGGGTG
 GTTGCTTACTCCATCCATAGCCAAGAACCAAAGGACCCACACGACCTCATGTTACCAT
 TCACCGGAGCACAGGCACCATCAGCGTCATCTCCAGTGGCCTGGACCGGGAAAAAGTCC
 CTGAGTACACACTGACCATCCAGGCCACAGACATGGATGGGGACGGCTCCACCACCACG
 GCAGTGGCAGTAGTGGAGATCCTTGATGCCAATGACAATGCTCCCATGTTTGACCCCCA
 GAAGTACGAGGCCCATGTGCCTGAGAATGCAGTGGGCCATGAGGTGCAGAGGCTGACGG
 TCACTGATCTGGACGCCCCCAACTCACCAGCGTGGCGTGCCACCTACCTTATCATGGGC
 GGTGACGACGGGGACCATTTTACCATCACCACCCACCCTGAGAGCAACCAGGGCATCCT
 GACAACCAGGAAGGGTTTGGATTTTGGAGGCCAAAAACCAGCACACCCTGTACGTTGAAG
 TGACCAACGAGGCCCTTTTGTGCTGAAGCTCCCAACCTCCACAGCCACCATAGTGGTC
 CACGTGGAGGATGTGAATGAGGCACCTGTGTTTGTCCACCCTCCAAAGTCGTTGAGGT
 CCAGGAGGGCATCCCCACTGGGGAGCCTGTGTGTGTCTACACTGCAGAAGACCCTGACA
 AGGAGAATCAAAAGATCAGCTACCGCATCCTGAGAGACCCAGCAGGGTGGCTAGCCATG
 GACCCAGACAGTGGGCAGGTCAACAGCTGTGGGCACCTCGACCGTGAGGATGAGCAGTT
 TGTGAGGAACAACATCTATGAAGTCATGGTCTTGGCCATGGACAATGGAAGCCCTCCCA
 CCACTGGCACGGGAACCCTTCTGCTAACACTGATTGATGTCAATGACCATGGCCCAGTC
 CCTGAGCCCCGTGAGATCACCATCTGCAACCAAGCCCTGTGCGCCAGGTGCTGAACAT
 CACGGACAAGGACCTGTCTCCCCACACCTCCCCTTTCCAGGCCAGCTCACAGATGACT
 CAGACATCTACTGGACGGCAGAGGTCAACGAGGAAGGTGACACAGTGGTCTTGTCCCTG
 AAGAAGTTCCTGAAGCAGGATACATATGACGTGCACCTTTCTCTGTCTGACCATGGCAA
 CAAAGAGCAGCTGACGGTGATCAGGGCCACTGTGTGCGACTGCCATGGCCATGTCGAAA
 CCTGCCCTGGACCCTGGAAGGGAGGTTTCATCCTCCCTGTGCTGGGGGCTGTCCTGGCT
 CTGCTGTTCTCCTGCTGGTGCTGCTTTTGTGTTGGTGAGAAAGAAGCGGAAGATCAAGGA
 GCCCCTCCTACTCCAGAAGATGACACCCGTGACAACGTCTTCTACTATGGCGAAGAGG
 GGGGTGGCGAAGAGGACCAGGACTATGACATCACCCAGCTCCACCGAGGTCTGGAGGCC
 AGGCCGGAGGTGGTTCTCCGCAATGACGTGGCACCAACCATCATCCCGACACCCATGTA
 CCGTCTCGGCCAGCCAACCCAGATGAAATCGGCAACTTTATAATTGAGAACCTGAAGG
 CGGCTAACACAGACCCACAGCCCCGCCCTACGACACCCCTCTTGGTGTTCGACTATGAG
 GGCAGCGGCTCCGACGCGCGTCCCTGAGCTCCCTCACCTCCTCCGCTCCGACCAAGA
 CCAAGATTACGATTATCTGAACGAGTGGGGCAGCCGCTTCAAGAAGCTGGCAGACATGT
 ACGGTGGCGGGGAGGACGACTAGGCGGCCTGCCTGCAGGGCTGGGGACCAACGTCAGG
 CCACAGAGCATCTCCAAGGGGTCTCAGTTCCCCCTTCAGCTGAGGACTTCGGAGCTTGT

Fig. 6

Nucleic acid sequence of ColoUp3
 (SEQ ID NO: 7)

CAGGAAGTGGCCGTAGCAACTTGGCGGAGACAGGCTATGAGTCTGACGTTAGAGTGGT
GCTTCCTTAGCCTTTCAGGATGGAGGAATGTGGGCAGTTTGACTTCAGCACTGAAAACC
TCTCCACCTGGGCCAGGGTTGCCTCAGAGGCCAAGTTTCCAGAAGCCTCTTACCTGCCG
TAAAATGCTCAACCCTGTGTCCTGGGCCTGGGCCTGCTGTGACTGACCTACAGTGGACT
TTCTCTCTGGAATGGAACCTTCTTAGGCCTCCTGGTGCAACTTAATTTTTTTTTTTAAT
GCTATCTTCAAAACGTTAGAGAAAGTTCTTCAAAAGTGCAGCCCAGAGCTGCTGGGCCC
ACTGGCCGTCCTGCATTTCTGGTTTCCAGACCCCAATGCCTCCCATTTCGGATGGATCTC
TGCGTTTTTATACTGAGTGTGCCTAGGTTGCCCTTATTTTTTATTTTCCCTGTTGCGT
TGCTATAGATGAAGGGTGAGGACAATCGTGTATATGTACTAGAACTTTTTTATTAAAGA
AACTTTTCCCAGAAAAAA

Fig. 6 continued.
Nucleic acid sequence of ColoUp3
(SEQ ID NO: 7)

ATGAAGCACCTGAAGCGGTGGTGGTCGGCCGGCGGCGGCCTCCTGCACCTCACCCCTCCT
 GCTGAGCTTGGCGGGGCTCCGCGTAGACCTAGATCTTTACCTGCTGCTGCCGCCGCCCA
 CCCTGCTGCAGGACGAGCTGCTGTTCTTGGGCGGCCCCGGCCAGCTCCGCCTACGCGCTC
 AGCCCCCTTCTCGGCCTCGGGAGGGTGGGGGCGCGCGGGCCACTTGCACCCCAAGGGCCG
 GGAGCTGGACCCTGCCGCGCCGCCGAGGGCCAGCTGCTCCGGGAGGTGCGCGCGCTCG
 GGGTCCCCTTCGTCCCTCGCACCAGCGTGGATGCATGGCTGGTGCACAGCGTGGCTGCC
 GGGAGCGCGGACGAGGCCACGGGCTGCTCGGCGCCGCCGCCGCTCGTCCACCGGAGG
 AGCCGGCGCCAGCGTGGACGGCGGCAGCCAGGCTGTGCAGGGGGGCGGCGGGGACCCCC
 GAGCGGCTCGGAGTGGCCCCCTTGGACGCCGGGGAAGAGGAGAAGGCACCCGCGGAACCG
 ACGGCTCAGGTGCCGGACGCTGGCGGATGTGCGAGCGAGGAGAATGGGGTACTAAGAGA
 AAAGCACGAAGCTGTGGATCATAGTTCCCAGCATGAGGAAAATGAAGAAAGGGTGTGAG
 CCCAGAAGGAGAACTCACTTCAGCAGAATGATGATGATGAAAACAAAATAGCAGAGAAA
 CCTGACTGGGAGGCAGAAAAGACCACTGAATCTAGAAATGAGAGACATCTGAATGGGAC
 AGATACTTCTTTCTCTCTGGAAGACTTATTCAGTTGCTTTTCATCACAGCCTGAAAATT
 CACTGGAGGGCATCTCATTTGGGAGATATTCCTCTTCCAGGCAGTATCAGTGATGGCATG
 AATTCTTCAGCACATTATCATGTAACTTCAGCCAGGCTATAAGTCAGGATGTGAATCT
 TCATGAGGCCATCTTGCTTTGTCCCAACAATACATTTAGAAGAGATCCAACAGCAAGGA
 CTTTACAGTCACAAGAACCATTCTGTCAGTTAAATTTCTCATACCACCAATCCTGAGCAA
 ACCCTTCTCTGGAACCTAATTTGACAGGATTTCTTTTACCAGGTTGACAATCATATGAGGAA
 TCTAACAAGCCAAGACCTACTGTATGACCTTGACATAAATATATTTGATGAGATAAACT
 TAATGTCATTGGCCACAGAAGACAACCTTTGATCCAATCGATGTTTTCTCAGCTTTTTTGAT
 GAACCAGATTCTGATTCTGGCCTTTCTTTTAGATTCAAGTCACAATAATACCTCTGTGAT
 CAAGTCTAATTCCTCTCACTCTGTGTGTGATGAAGGTGCTATAGGTTATTGCACTGACC
 ATGAATCTAGTTCCCATCATGACTTAGAAGGTGCTGTAGGTGGCTACTACCCAGAACCC
 AGTAAGCTTTGTCACTTGGATCAAAGTGATTCTGATTTCATGGAGATCTTACATTTCA
 ACACGTATTTTATAACCACACTTACCACCTTACAGCCAACCTGCACCAGAATCTACTTCTG
 AACCTTTTTCCGTGGCCTGGGAAGTCACAGAAGATAAGGAGTAGATACCTTGAAGACACA
 GATAGAACTTTGAGCCGTGATGAACAGCGTGCTAAAGCTTTGCATATCCCTTTTTTCTGT
 AGATGAAATTGTGCGCATGCCTGTTGATTCTTTCAATAGCATGTTAAGTAGATATTATC
 TGACAGACCTACAAGTCTCACTTATCCGTGACATCAGACGAAGAGGGAAAAATAAAGTT
 GCTGCGCAGAACTGTGTAACGCAAATTGGACATAATTTTGAATTTAGAAGATGATGT
 ATGTAACCTTGCAAGCAAAGAAGGAACTCTTAAGAGAGAGCAAGCACAAATGTAACAAAG
 CTATTAACATAATGAAACAGAACTGCATGACCTTTATCATGATATTTTTTAGTAGATTA
 AGAGATGACCAAGGTAGGCCAGTCAATCCCAACCACTATGCTCTCCAGTGTACCCATGA
 TGGAAGTATCTTGATAGTACCCAAAGAACTGGTGGCCTCAGGCCACAAAAGGAAACCC
 AAAAGGGAAAGAGAAAGTGAGAAGAACTGAAGATGGACTCTATTATGTGAAGTAGTAA
 TGTTTCAGAACTGATTATTTGGATCAGAAACCATTGAAACTGCTTCAAGAATTGTATCT
 TTAAGTACTGCTACTTGAATAACTCAGTTAACGCTGTTTTGAAGCTTACATGGACAAAT
 GTTTAGGACTTCAAGATCACACTTGTGGGCAATCTGGGGGAGCCACAACTTTTTCATGAA
 GTGCATTGTATACAAAATTCATAGTTATGTCCAAAGAATAGGTTAACATGAAAACCCAG
 TAAGACTTTCCATCTTGGCAGCCATCCTTTTTTAAGAGTAAGTTGGTTACTTCAAAAAGA
 GCAAACACTGGGGATCAAATTATTTTAAGAGGTATTTTCAAGTTTAAATGCAAAATAGCC
 TTATTTTCATTTAGTTTGTAGCACTATAGTGAGCTTTTCAAACACTATTTTAATCTTT
 ATATTTAACTTATAAATTTTGCTTTCTATGGAAATAAATTTTGTATTTGTATTAAAAAA
 AAAAAA

Fig. 7

Nucleic acid sequence of ColoUp4
 (SEQ ID NO: 8)

ATGAAGTTGGAGGTGTTCGTCCCTCGCGCGGCCACGGGGACAAGCAGGGCAGTGACCT
 GGAGGGCGCGGGCGGCAGCGACGCGCCGTCCCCGCTGTCGGCGGCGGGAGACGACTCCC
 TGGGCTCAGATGGGGACTGCGCGGCCAAGCCGTCCGCGGGCGGCGGCCAGAGATACG
 CAGGGCGACGGCGAACAGAGTGCGGGAGGCGGGCCGGGCGCGGAGGAGGCGATCCCGGC
 AGCAGCTGCTGCAGCGGTGGTGGCGGAGGGCGCGGAGGCCGGGGCGGCGGGGCCAGGCG
 CGGGCGGCGCGGGGAGCGGCGAGGGTGACGCGAGCAAGCCATATACGCGGCGGGCCCAAG
 CCCCCTACTCGTACATCGCGCTCATCGCCATGGCCATCCGCGACTCGGCGGGCGGGCG
 CTTGACGCTGGCGGAGATCAACGAGTACCTCATGGGCAAGTTCCCCTTTTTCCGCGGCA
 GCTACACGGGCTGGCGCAACTCCGTGCGCCACAACCTTTTCGCTCAACGACTGCTTCGTC
 AAGGTGCTGCGCGACCCCTCGCGGCCCTGGGGCAAGGACAACCTACTGGATGCTCAACCC
 CAACAGCGAGTACACCTTCGCCGACGGGGTCTTCCGCCGCCGCCGCAAGCGCCTCAGCC
 ACCGCGCGCCGGTCCCCGCGCCCGGGCTGCGGCCCGAGGAGGCCCGGGCCTCCCCGCC
 GCCCCGCCGCCCGCGCCCGCCGCCCGGGCCTCGCCCCGCATGCGCTCGCCCGCCCGCCA
 GGAGGAGCGCGCCAGCCCCGCGGGCAAGTTCTCCAGCTCCTTCGCCATCGACAGCATCC
 TGC GCAAGCCCTTCGCGAGCCGTGCGCTCAGGGACACGGCCCCCGGGACGACGCTTCAG
 TGGGGCGCCGCGCCCTGCCCGCCGTGCCCCGCGTTCCCCGCGCTCCTCCCCGCGGCGCC
 CTGCAGGGCCCTGCTGCCGCTCTGCGCGTACGGCGCGGGCGAGCCGGCGCGGCTGGGCG
 CGCGCGAGGCCGAGGTGCCACCGACCGCGCCGCCCTCCTGCTTGACCTCTCCCGGCG
 GCGGCCCCCGCCAAGCCACTCCGAGGCCCGGCGGCCGGCGCGCGCACCTGTACTGCCC
 CCTGCGGCTGCCCCGAGCCCTGCAGGCGGCCTTAGTCCGNCGTCTGGCCCCGACCTGT
 CGTACCCGGTGGAGACGCTCCTAGCTTGA

Fig. 8
 Nucleic acid sequence of ColoUp5
 (SEQ ID NO: 9)

GGCAGATGAAATATAAGATTTCATCAACCACATTTGACAGCCCATGGCAGGTTTCCTGTT
TTCCATCGTCCCTCTGCAGGTACAGACACACAGAGCCCAGCCGTGGCAGGCTCAGCCG
GGGTCCGGGGCTGCTAACAACGGCTACATTCTCTCCCCAGGGCCAAGGGAAATCCTGAG
CGCAGGCCAGGGTTGTTTGGTTTTGAGGTGTGCTGGGATGAAAGGCACCCTGGAAGTGG
AAGGTTTCGGTCATTCATTAATTAATTACATCTATAATTGAGGGTTTGTTCTTAAGAGCG
AGTCCTTTGAAAGTACTTTCTTCAAACAGTGACTGCCACAAAGGCATCAGATATTCAC
CACCTTCTCGGCTGCCTCAGCACAGCAAGCTTTATTCTGGGACCTGAGATCCTGTTCTG
AGCTGGCTTTCCCTTCTCCAGGCTCGCTCACCTFCCCTTTAGAGATAGTGGATGGTAAG
ATGACCAATGCTCAGATTATTCTTCTCATTGACAATGCCAGGATGGCAGTGGATGACTT
CAACCTCAAGAAATGGAGAAGCATCATGTGCCAAGTGACTTCAATGTCAATGTGAAGGT
GGATACAGGTCCCAGGGAAGATCTGATTAAGGTCCTGGAGGATATGAGACAAGAATATG
AGCTTATAATAAAGAAGAAGCATCGAGACTTGGACACTTGGTATAAAGAACAGTCTGCA
GCCATGTCCCAGGAGGCAGCCAGTCCAGCCACTGTGCAGAGCAGACAAGGTGACATCCA
CGAACTGAAGCGCACATTCCAGGCCCTGGAGATTGACCTGCAGGCACAGTACAGCACGA
AATCTGCTTTGGAAAACATGTTATCCGAGACCCAGTCTCGGTACTCCTGCAAGCTCCAG
GACATGCAAGAGATCATCTCCCACTATGAGGAGGAACTGACGCAGCTACGCCACGAACT
GGAGCGGCAGAACAAATGAATACCAAGTGCTGCTGGGCATCAAAACCCACCTGGAGAAGG
AAATCACCACGTACCGACGGCTCCTGGAGGGAGAGAGTGAAGGGACACGGGAAGAATCA
AAGTCGAGCATGAAAGTGTCTGCAACTCCAAAGATCAAGGCCATAACCCAGGAGACCAT
CAACGGAAGATTAGTTCTTTGTCAAGTGAATGAAATCCAAAAGCACGCATGAGACCAAT
GAAAGTTTCCGCCTGTTGTAAATCTATTTTCCCCAAGGAAAGTCCTTGCACAGACAC
CAGTGAGTGAGTTCTAAAAGATACCTTGGGAATTATCAGACTCAGAACTTTTATTTTT
TTTTTCTGTAAACAGTCTCACCAGACTTCTCATAATGCTCTTAATATATTGCACTTTTCT
AATCAAAGTGCGAGTTTATGAGGGTAAAGCTCTACTTTCCTACTGCAGCCTTCAGATTC
TCATCATTTTGCATCTATTTTGTAGCCAATAAACTCCGCACTAGCAAAAAAAAAAAAA

Fig. 9
Nucleic acid sequence of ColoUp6
(SEQ ID NO: 10)

TTTTTTTTTTAAAAAAGAGGCTTGGTAAGTTTTTGATGCTTAGTTGACTTTTAGCATT
ATCCAGCATTTGTATTATGAACCAGTGAGTACTGTAATTTTTCTTTCCCTTTCAGAAAG
ACTCAAAGGGAACATATAAATGTTTCCTATTTTAAATGTGGCAATAGTGTAGCTAACAC
TGGTACAGACGGAATAAACACACCTCTAATATTCTCCTGAAGATTTGGTGATCCAGTTT
CAAATAAGGTATGGGAAAAACAGATGTTTTCATTATCGCCACTTAATCCTTACTTCCGA
TTATAATTATACATGTTTGGCTGTAATAACTATACTAAAGCATGCTTGTGAAAGTAGAC
TTCTACAAGGACAGAAAACCCACAACAACAAAGATCGATCACGAAAGACAAGGCATA

Fig. 10
Nucleic acid sequence of ColoUp7
(SEQ ID NO: 11)

CTTTTCTTCCGCACGGTTGGAGGAGGTCGGCTGGTTATCGGGAGTTGGAGGGCTGAGGT
 CGGGAGGGTGGTGTGTACAGAGCTCTAGGACTCACGCACCAGGCCAGTCGCGGATTTTG
 GGCCGAGGCCTGGGTTACAAGCAGCAAGTGC GCGGTTGGGGCCACTGCGAGGGCCGTTTT
 AGAAAAC TGTTTAAACAAAGAGCAATTGATGGATAAATCAGGAATAGATTCTCTTGAC
 CATGTGACATCTGATGCTGTGGAAC TTGCAAATCGAAGTGATAACTCTTCTGATAGCAG
 CTTATTTAAAC TCAAGTGTATCCCTTACTCACCTAAAGGGGAGAAAAGAAACCCCATTC
 GAAAATTTGTTCTGACACCTGAAAGTGTTCACGCAAGTGATTCATCAAGTGACTCATCT
 TTTGAACCAATACCAT TGACTATAAAAGCTATTTTGGAAAGATTCAAGAACAGGAAAAA
 GAGATATAAAAAAAGAAAAAGAGGAGGTACCAGCCAACAGGAAGACCACGGGGAAGAC
 CAGAAGGAAGGAGAAATCCTATATACTCACTAATAGATAAGAAGAAACAATTTAGAAGC
 AGAGGATCTGGCTTCCCATTTT TAGAATCAGAGAATGAAAAAACGCACCTTGGAGAAA
 AATTTTAACGTTTGAGCAAGCTGTTGCAAGAGGATTTT TTA ACTATATTGAAAAGCTGA
 AGTATGAACACCACCTGAAAGAATCATTGAAGCAAATGAATGTTGGTGAAGATTTAGAA
 AATGAAGATTTTGACAGTCGTAGATACAAATTTTGGATGATGATGGATCCATTTCTCC
 TATTGAGGAGTCAACAGCAGAGGATGAGGATGCAACACATCTTGAAGATAACGAATGTG
 ATATCAAATTTGGCAGGGGATAGTTTCATAGTAAGTTCTGAATTCCTGTAAAGACTGAGT
 GTATACTTAGAAGAAGAGGATATTACTGAAGAAGCTGCTTTGTCTAAAAAGAGAGCTAC
 AAAAGCCAAAAATACTGGACAGAGAGGCCTGAAAATGTGACAGGATCATGAATGTCAA
 GGCTTTTATCTTGAGAACATGGTGTCTGGAGTTAAAGGTATTGGCATACTCCACACATC
 TGTACCATTCTTGAGTGATCGCTTAGGAATGAATGTGATT TGA ACTCATTCATGTTGAG
 AGGGTGTCAAATTGAGAACCAGGTAGATCCCCACCACCTACAGTAAAAAGGACCCTAAA
 GTAAATTTGGTTGAAGAAATTAGATCCCAAAGATTCTTGGTGAATTTTGAAGTCTTCATC
 AGTATATCCATATTTAAACGAGATGACAGAAGCCAAAGTAATTATGGCAAGTAATGGTT
 TTTATCTTAACTATAAGTTATTTGCTCAAGGGTGTAATGGTCATTACCAAGGCTTTTAG
 AATGCAGTTTCTCATTTGCTGTGGACATGACCATAAAAAAAATTTCC CAGTAGGTTTT
 CTATCTGCTACGTTGCTAGCAATCAGCTTATTGGGAACAGTTGATTAACTGTAATAGAA
 ATGCAATACAAATAAAATGTGAACCACATGTGATTTTTCTTTAAAATCAGTGAGATTTG
 AAAATTTCTCCTAGATCTCTTGAATCATGCAAATTTGCTTTGCCTTTATATTGTAACCT
 TGTGGGTTGCTAATAACCAAGCAGTTTGTAGTAGAGTTAACTCAGGCTCGTTCTAGGGA
 CTCATTCATGTTCACTCACTGTACACTCATCTCTGGAAATGTAAAATTTACTTTTATAC
 TATTGTTATGTAGGGCTGACAGGACAAC TGGATCAGTTTCATTAAAAAGGTATGTATGC
 ATTAGAAAAGACATTTGTATGGGTCA TTTCAAAGAGGGCTTATGAGGCTGTGAAACCA
 GAGCTCTTAACGCTGTGACCAAAGATGGAAGTTCTCTATAGGAAGCCATAGCACTCCTA
 ATGTTTGGTGCTATGTTTTCTTGAGGAGATATAAACGTAATAATCCATGATTGTTGCC
 ATGTGAGAGTTTTAAAGGTTAATCAAATTTCTCTTCTTCAGGGCAAAC TTGAAGATAA
 ATCTTTTGACTCCAGCTCTTTAGAGGATCTAAAGTGACCTTGATGGACAGTGGAAGAAA
 TCACAACATGGAATTCCTCGAATAACAATTTATTGACTTTAAATAATTTTGTCTAATGC
 TACATATACACAATTA AAAACCTTTACACTATTTCTAGAAAGTCAGCATGTATTTTGTG
 GCTCGAAGTTTCTCTAGTGTTTTCTGTGGAAGGAATAAAAATTTGAGTTTCAAAAAAA
 AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

Fig. 11
 Nucleic acid sequence of ColoUp8
 (SEQ ID NO: 12)

MGAAGRQDFLFKAMLTISWLTLTCTPGATSTVAAGCPDQSPPELQPWNPBGHDQDHHVHIG
 QGKTLTLLTSSATVYSIHISEGGKLVIKDHDEPIVLRTRHILIDNGGELHAGSALCPFQ
 NFTIILYGRADEGIQDPYYGLKYIGVGKGGALELHGQKKLSWTFLNKTLHPGGMAEGG
 YFFERSWGHRGVIVHVIDPKSGTVIHSDRFDTYRSKKESERLVQYLNAVDPGRILSVAV
 NDEGSRNLDDMARKAMTKLGSKHFLHLGFRHPWSFLTVMGNPSSSVEDHIEYHGHRS
 AARVFKLFQTEHGEYFNVSLSSEWVQDVETEFWDHDKVSQTKGGEKISDLWKAHPGKI
 CNRPIDIQATTMDGVNLSTEVVYKKGQDYRFACYDRGRACRSYRVRFCLCGKPVPRPKLTV
 TIDTNVNSTIILNLEDNVQSWKPGDTLVIASTDYSMYQAEFEQVLPCRSCAPNQVKVAGK
 PMYLHIGEEIDGVDMRAEVGLLSRNIIVMGEMEDKCYPYRNHICNFFDFDTFGGHIKFA
 LGFKAHLEGTELKHMGGQLVGQYPIHFHLAGDVDERGGYDPPTYIRDLSTHHTFSRCV
 TVHGSNGLLIKDVVGYNLGHCFFTEDGPEERNTFDHCLGLLVKSGTLLPSDRDSKMCK
 MITEDSYPGYIPKPRQDCNAVSTFWMANPNNNLINCAAAGSEETGFWFIFHHVPTGPSV
 GMYSPGYSEHIPLGKFYNNRAHSNYRAGMIIDNGVKTTEASAKDKRPFLSIISARYSPH
 QDADPLKPREPAIIRHFIAYKNQDHGAWLRGGDVWLDSCRFDNGIGLTLASGGTFPYD
 DGSKQEIKNSLFVGESGNVGTMMDNRIWGPGLDHSGRTPIGQNFPIRGIQLYDGPI
 NIQNCTFRKFVALEGRHTSALAFRLNNAWQSCPHNNVTGIAFEDVPITSRVFFGEPGPW
 FNQLDMDGDKTSVFHDVDGVSVEYPGSYLTKNNDNLVLRHPDCINVPDWRGAIICSGCYAQ
 MYIQAYKTSNLRMKIKNDFPSHPLYLEGALTRSTHYQQYQPVVTLQKGYTIHWDQTAP
 AELAIWLINFNKGDWIRVGLCYPRGTTFSILSDVHNRLKQTSKTGVFVRTLQMDKVEQ
 SYPGRSHYYWDEDSGLLFLKLKAQNEREKFAFCMKGCEKIKALIPKNAGVSDCTAT
 AYPKFTERAVVDVPMPPKLFGLKTKDHFLEVKMESSKQHFFHLWNDFAFIEVDGKKY
 PSSDGIQVVVIDGNQGRVVSHTSFRNSILQGIPWQLFNYVATIPDNSIVLMASKGRYV
 SRGPWTRVLEKLGADRGLKLKEQMAFVGFKGSFRPIWVTLDTEDEHKAKIFQVVPIPVVK
 KKKL

Fig. 12

Amino acid sequence of full-length ColoUp1 protein
 (SEQ ID NO: 13)

MPPFLLLEAVCVFLFSRVPPSLPLQEVHVSKETIGKISAASKMMWCSAAVDIMFLLDGS
NSVGKGSFERSKHFAITVCDGLDISPERVRVGAFQFSSTPHLEFPLDSFSTQQEVKARI
KRMVFKGGRTETELALKYLLHRGLPGGRNASVPQILIIVTDGKSQGDVALPSKQLKERG
VTVFAVGVRFPWEELHALASEPRGQHVLAEQVEDATNGLFSTLSSSAICSSATPDCR
VEAHPCEHRTLEMVREFAGNAPCWGRSRRTLAVLAAHCPFYSWKRVFLTHPATCYRTTC
PGPCDSQPCQNGGTCVPEGLDGYQCLCPLAFGGEANCALKLSLECRVDLLFLLDSSAGT
TLDGFLRAKVFKRFVRAVLSEDSRARVGVATYSRELLVAVPVGEYQDVPDLVWSLDGI
PFRGGPTLTGSALRQAAERGFGSATRTGQDRPRRVVLLTESHSEDEVAGPARHARARE
LLLLGVGSEAVRAELEETGSPKHVMVYSDPDLEFNQIPELQGKLCSRQRP GCRTQALD
LVFMLDTSASVGPENFAQMOSFVRSCALQFEVNP DVTQVGLVVYGSQVQTAFGLDTKPT
RAAMLRAISQAPYLGGVGSAGTALLHIYDKVMTVQRGARPGVPKAVVVL TGGRGAEDAA
VPAQKLRRNNGISVLVVGVPVLSEGLRRLAGPRDSL IHVAAYADLR YHQDVLI EWLCGE
AKQPVNLCKPSPCMNEGSCVLQNGSYRCKCRD GWEGPHCENRFLRRP

Fig. 13

Amino acid sequence of full-length ColoUp2 protein
(SEQ ID NO: 14)

MRIAVICFCLLGITCAIPVKQADSGSSEEKQLYNKYPDAVATWLNPDPSQKQNLAPQT
LPSKSNESHDMDDMDEDDDDHVDSQDSIDSNDSDDVDDTDDSHQSDESHHSDESDEL
VTDFPTDLPATEVFTPVVPTVDITYDGRGDSVVYGLRSKSKKFRRPD IQYPDATDEDITS
HMESEELNGAYKAIPVAQDLNAPSDWDSRGKDSYETSQLDDQSAETHSHKQSRLYKRKA
NDESNEHSDVIDSQELSKVSREFHSHEFHSHEDMLVVDPKSKEEDKHLKFRI SHELDSA
SSEVN

Fig. 14
Amino acid sequence of full-length Osteopontin protein
(SEQ ID NO: 15)

MGLPRGPLASLLLLQVCWLQCAASEPCRAVFREAQVLEAGGAEQEPGQALGKVFMCPC
 GQEPALFSTDNDFTVRNGETVQERRSLKERNPLKIFPSKRILRRHKRDWVAVPISVPE
 NGKGPFPQRLNQLKSNKDRDTKIFYSITGPGADSPPEGVFAVEKETGWLLLLNKPLDREE
 IAKYELFGHAVSENGASVEDPMNISIIIVTDQNDHKPKFTQDTFRGSVLEGVLPGTSMQ
 VTATDEDDAIYTYNGVVAYSIIHSQEPKDPHDLMFTHIRSTGTISVISSGLDREKVPEYT
 LTIQATDMDGDGSTTTAVAVVEILDANDNAPMFDPQKYEAHVPENAVGHEVQRLTVTDL
 DAPNSPAWRATYILIMGGDDGDHFTITTHPESNQGILTRKGLDFEAKNQHTLYVEVTNE
 APFVLKLPTSTATIVHVEDVNEAPVFVPPSKVVEVQEGIPTGEPVCVYTAEDPDKENQ
 KISYRILRDPAGWLAMPDSGQVTAVGTLTREDEQFVRNNIYEVMLAMDNGSPPTTGT
 GTLLTLIDVNDHGPVPEPRQITICNQSPVRQVLNITDKDLSPTSPFQAQLTDDSDIY
 WTAEVNEEGDTVVLSTLKKFLKQDQTYDVHLSLSDHGNKEQLTVIRATVCDCHGHVETCPG
 PWKGGFILPVLGAVLALLFLLLVLVLLLVLRKKRKIKEPLLLPEDDTRDNVFFYYGEEGGGE
 EDQDYDITQLHRGLEARPEVVLNRNDVAPTIIPTPMYRPRPANPDEIGNFIIENLKAANT
 DPTAPPYDTLLVFDYEGSGSDAASLSSLTSSASDQDQDYDYLNEWGSRFKKLADMYGGG
 EDD

Fig. 15

Amino acid sequence of full-length ColoUp3 protein
 (SEQ ID NO: 16)

MKHLKRWWSAGGGLLHLTLLLSLAGLRVDLDLYLLLPPPTLLQDELLFLGGPASSAYAL
SPFSASGGWGRAGHLHPKGRELDPAAPPEGQLLREVRALGVFPVPTSVDALVHSVAA
GSADEAHGLLGAAAASSTGGAGASVDGGSQAVQGGGGDPRAARSGPLDAGEEEKAPAEP
TAQVPDAGGCASEENGVLREKHEAVDHSSQHEENEERVSAQKENSLLQNDDEENKIAEK
PDWEAEKTTESRNERHLNGTDTSFSLLEDLFQLLSSQPENSLEGISLGDIPLPGSISDGM
NSSAHYHVNFSSQAISQDVNLHEAILLCPNNTFRRDPTARTSQSQEPFLQLNSHTTNPEQ
TLPGTNLTGFLSPVDNHRNLTSQDLLYDLINIFDEINLMSLATEDNFDPIDVSQFLD
EPDSDSGLSLDSSHNTSVIKSNSSHVSVCDEGAIGYCTDHESSSHDLEGAVGGYYPEP
SKLCHLDQSDSDFHGDLTFOHVFNHTYHLQPTAPESTSEFPFPWPGKSQKIRSRYLEDT
DRNLSRDEQRAKALHIPFSVDEIVGMPVDSFNSMLSRYYLTDLQVSLIRDIRRGKNKV
AAQNCRKRKLDIILNLEDDVCNLQAKKETLKREQAQCNKAINIMKQKLHDLYHDI FSRL
RDDQGRPVNPNHYALQCTHDGSILIVPKELVASGHKKETQKGKRK

Fig. 16

Amino acid sequence of full-length ColoUp4 protein
(SEQ ID NO: 17)

MKLEVFVPRAAHGDKQGS DLEGAGGS DAPSPLSAAGDDSLGSDGDCAAKPSAGGGARDT
QGDGEQSAGGGPGAEEAI PAAAAA VVAEGAEAGAAGPGAGGAGSGEGARSKPYTRRPK
PPYSYIALIAMAIRDSAGGRLTLAEINEYLMGKF PFFRGSYTGWRNSVRHNLSLND CFV
KVL RDPSRPWGKDNYWMLNPNSEYTFADGVFRRRRKRLSHRAPVPAPGLRPEEAPGLPA
APPPAPAAPASPRMRSPARQEERASPA GKFSSSFAIDSILRKPFRRRLRDTAPGTTLQ
WGAAPCPPLPAFPALLPAAPCRALLPLCAYGAGEPARLGAREAEVPPTAPPLLLAPLPA
AAPAKPLRGPAAGGAHLYCPLRLPAALQAALVRRPGPHLSYPVETLLA

Fig. 17

Amino acid sequence of full-length ColoUp5 protein
(SEQ ID NO: 18)

MEKHHVPSDFNVNVKVDTGPREDLIKVLEDMRQYELIIKKKHRDLDTWYKEQSAAMSQ
EAASPATVQSRQGDIELKRTFQALEIDLQAQYSTKSALENMLSETQSRYSCKLQDMQE
IISHYEEELTQLRHELERQNNEYQVLLGIKTHLEKEITTYRRLLEGESEGTREESKSSM
KVSATPKIKAITQETINGRLVLCQVNEIQKHA

Fig. 18
Amino acid sequence of full-length ColoUp6 protein
(SEQ ID NO: 19)

MDKSGIDSLDHVTSDAVELANRSDNSSDSSLFKTQCIPYSPKGEKRNPIRKFVRTPESV
HASDSSSDSSFEPITIKAIERFKNRKKRYKKKKKRRYQPTGRPRGRPEGRRNPIYS
LIDKKKQFRSRGSGFPFLESENEKNAPWRKILTFEQAVARGFFNYIEKLKYEHLKESL
KQMNVGEDLENEFDSSRRYKFLDDGSIPIEESTAEDEDATHLEDNECDIKLAGDSFI
VSSEFPVRLSVYLEEEDITEEAALSKKRATKAKNTGQRGLKM

Fig. 19

Amino acid sequence of full-length ColoUp8 protein
(SEQ ID NO: 20)

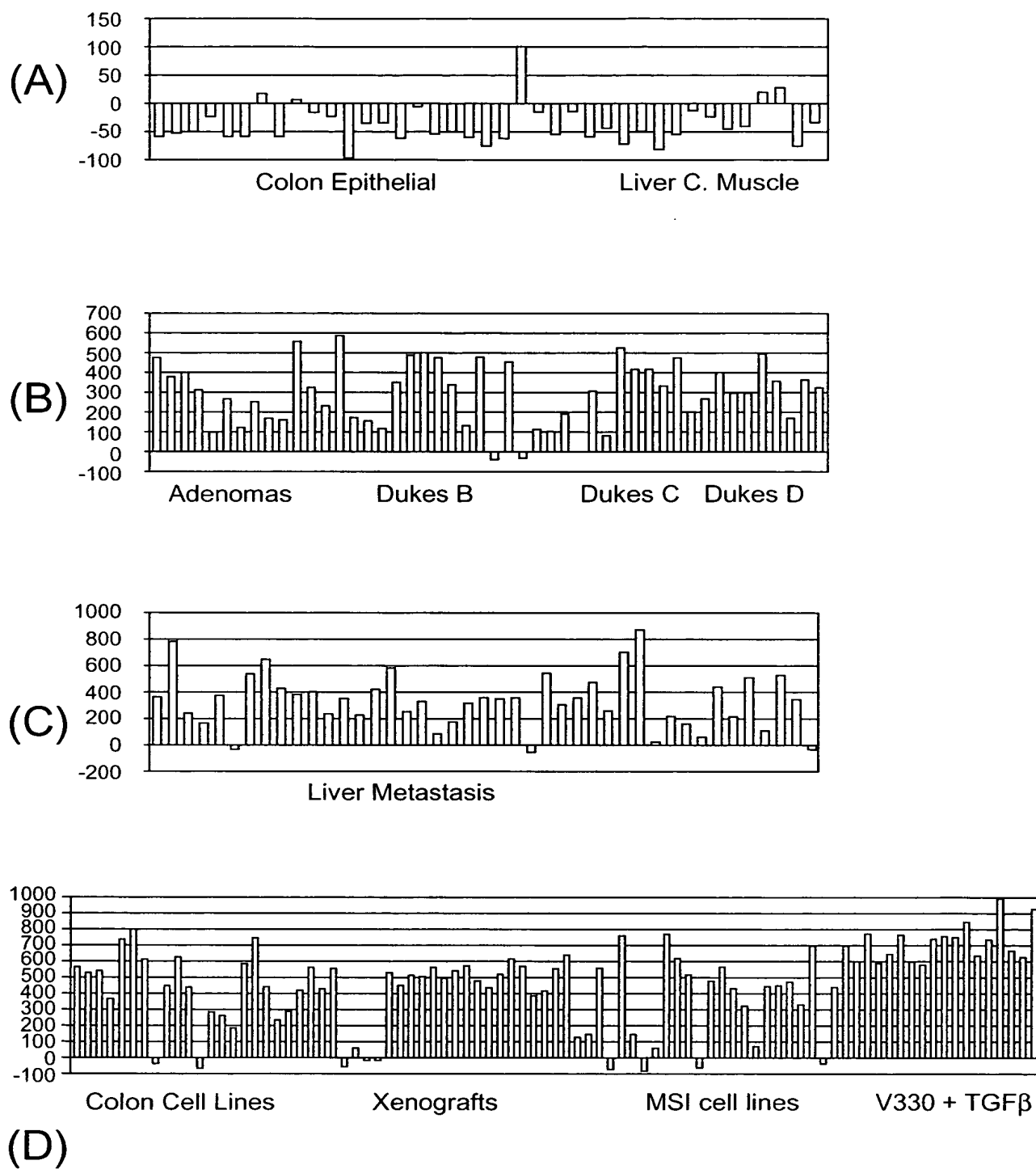


Fig. 20

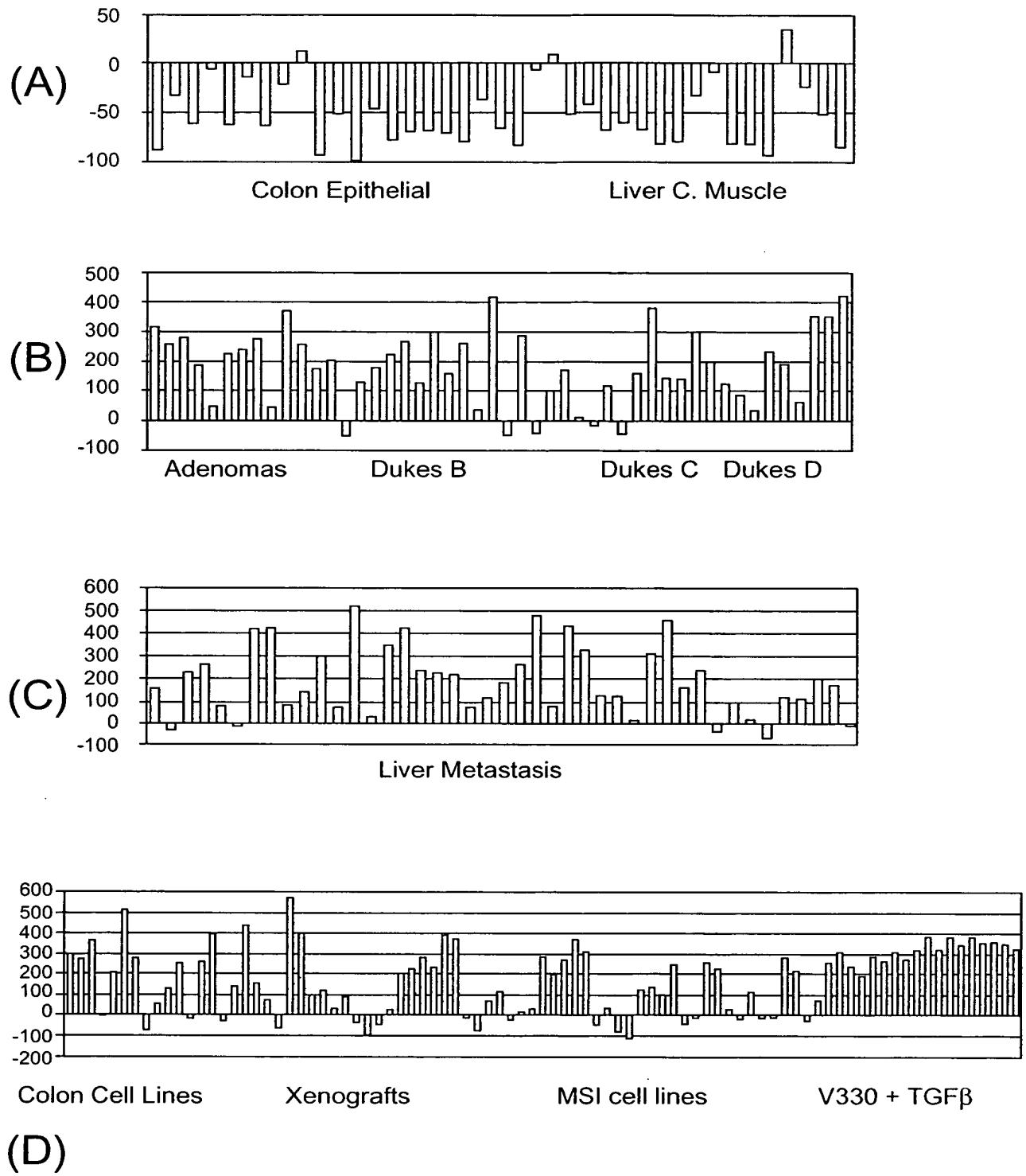


Fig. 21

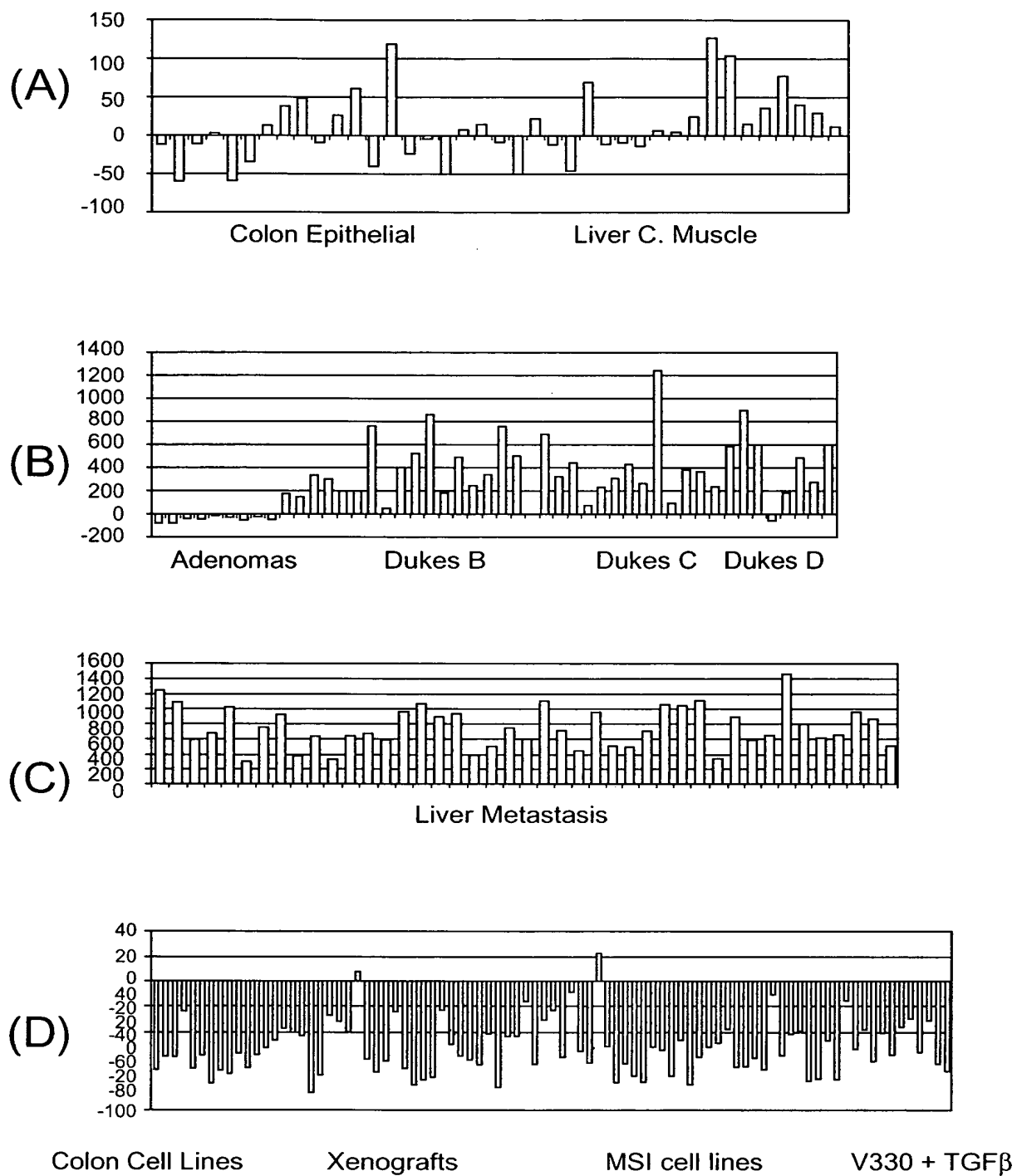


Fig. 22

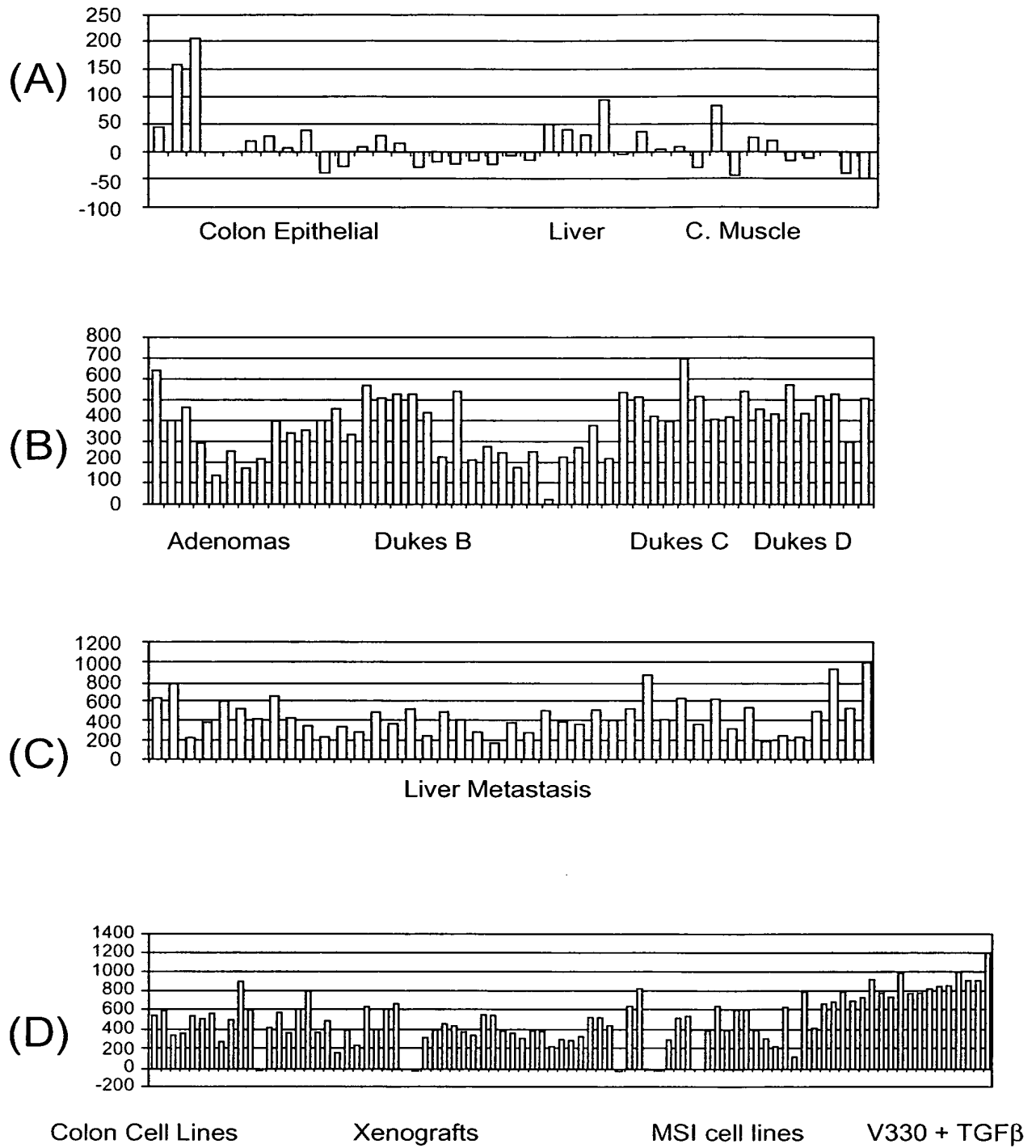


Fig. 23

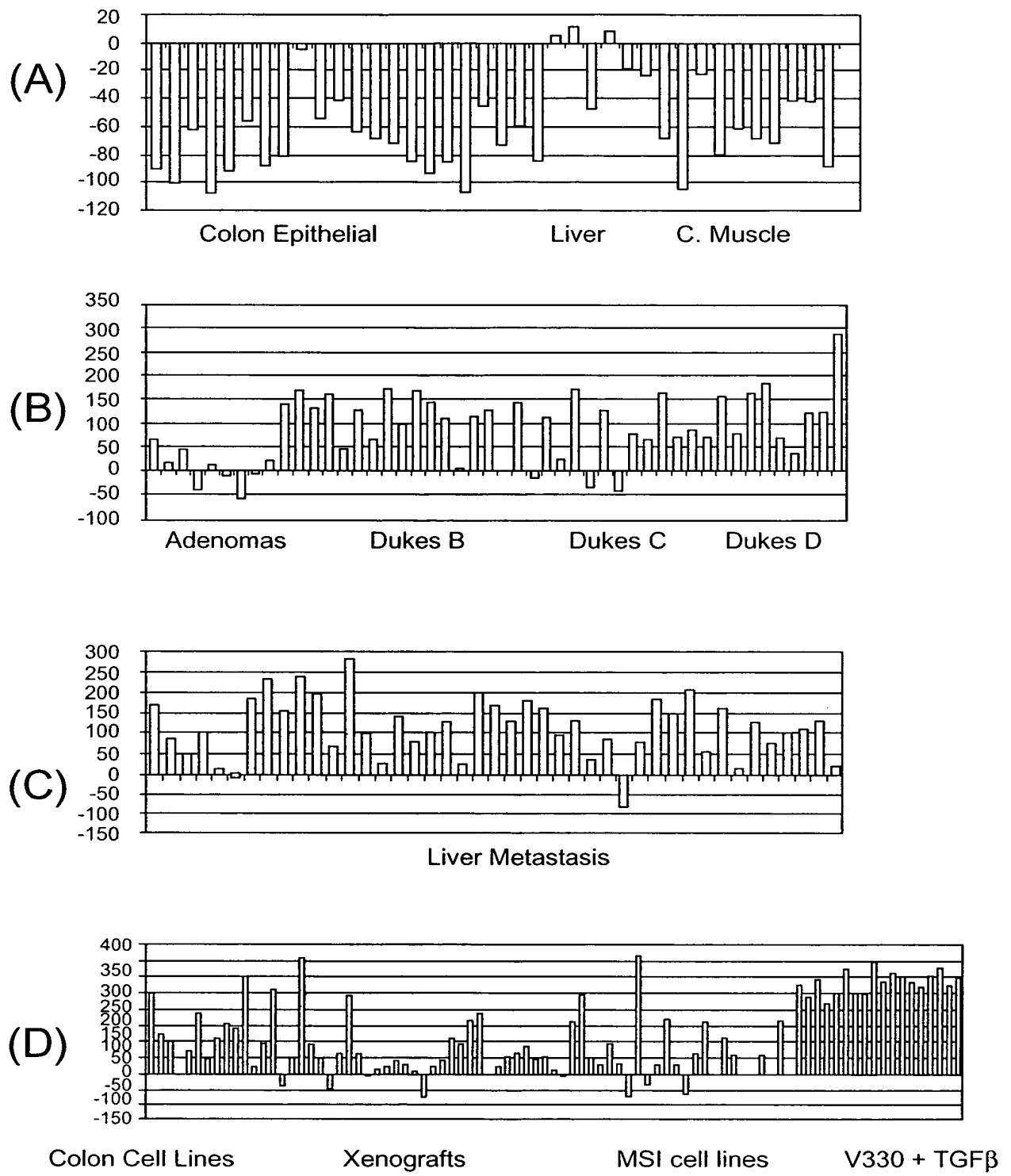


Fig. 24

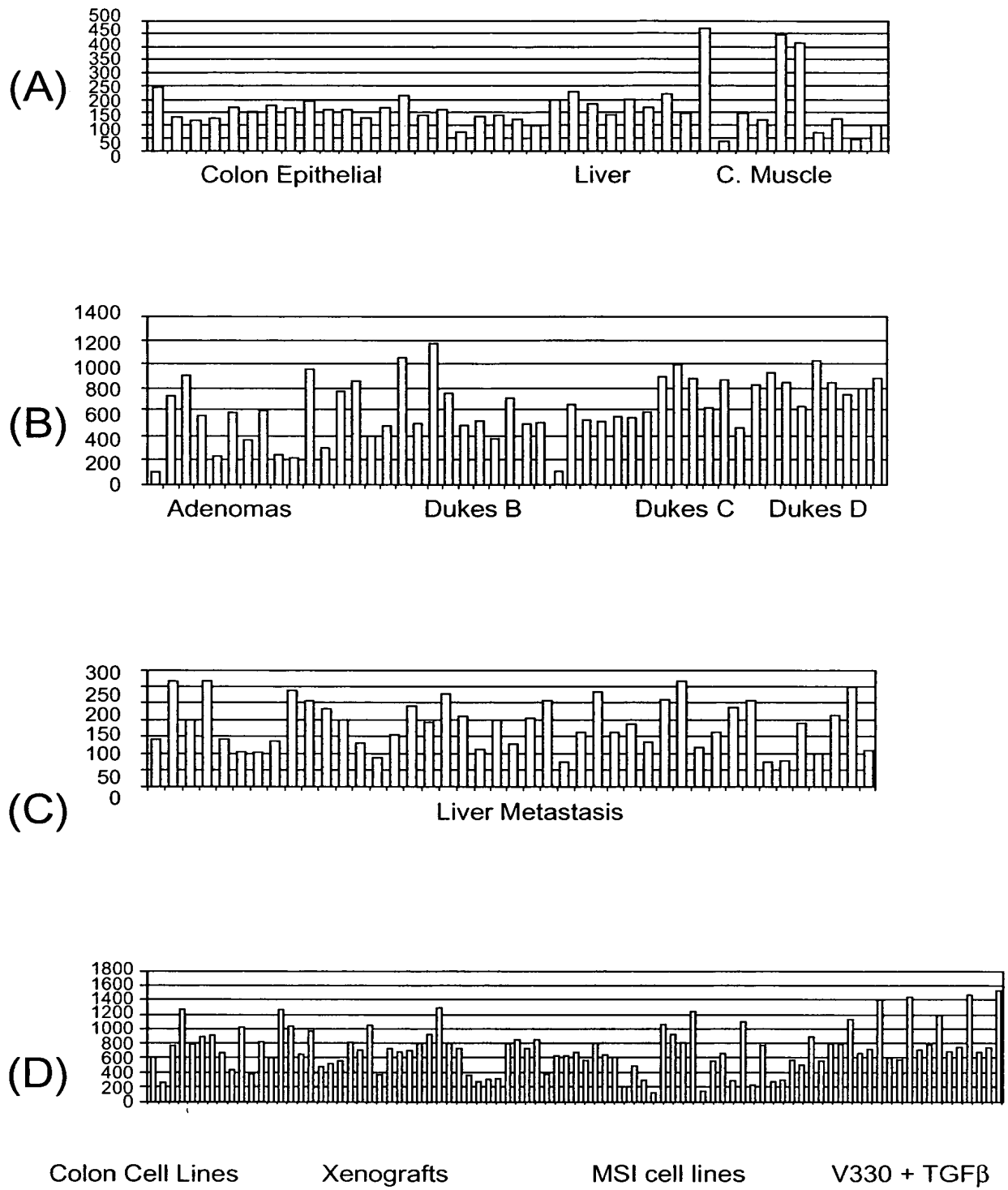


Fig. 25

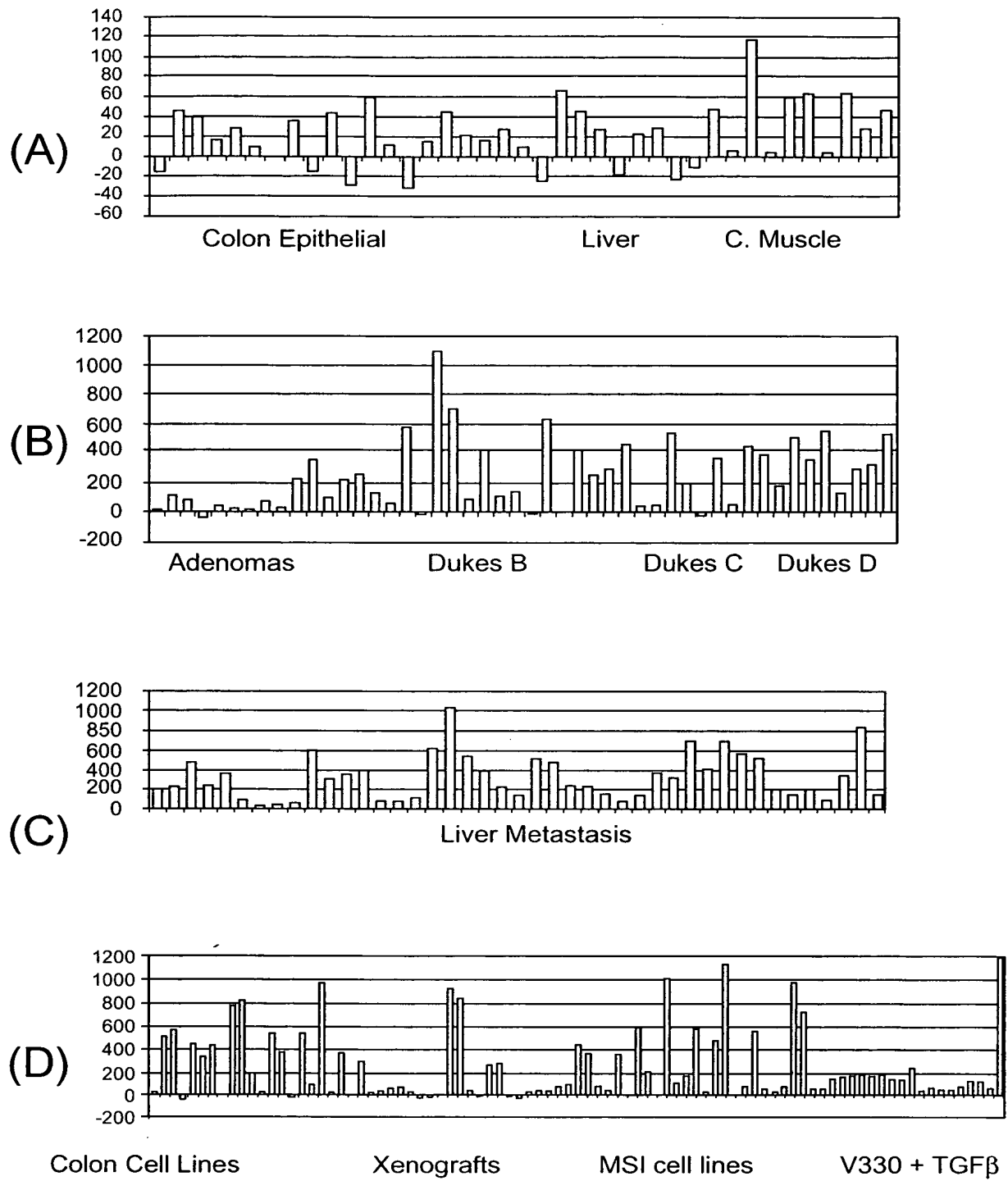


Fig. 26

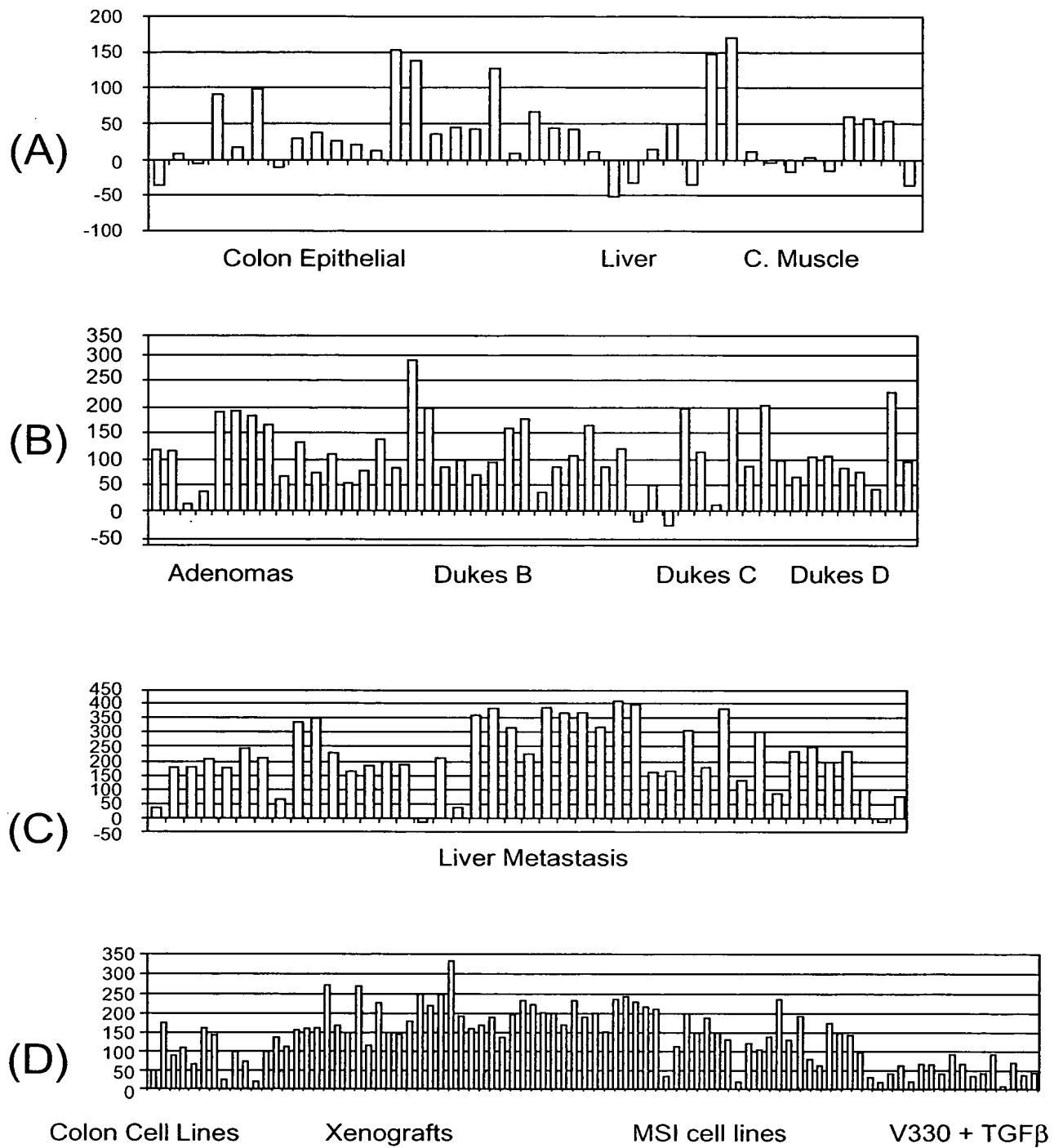


Fig. 27

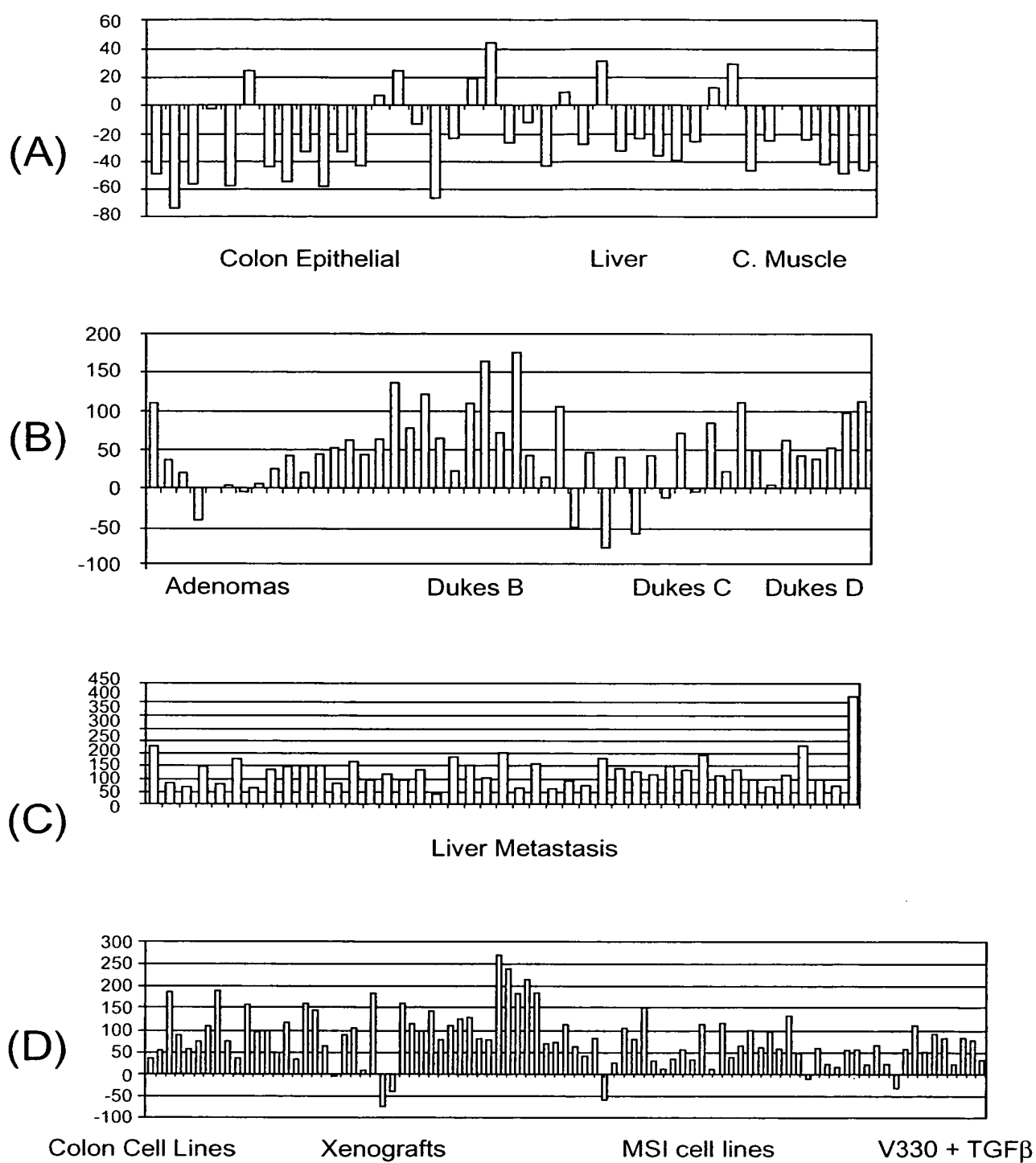


Fig. 28

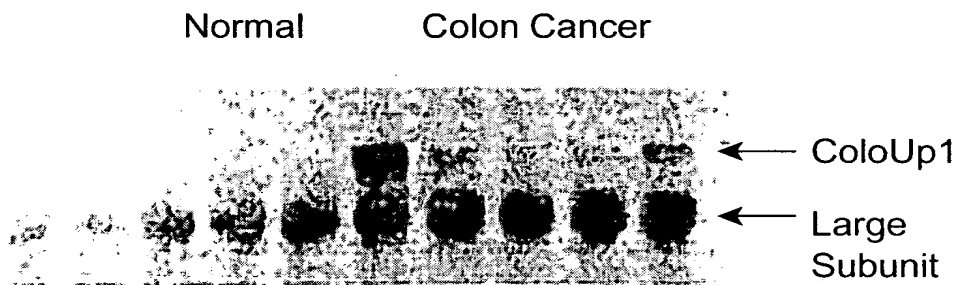


Fig. 29A

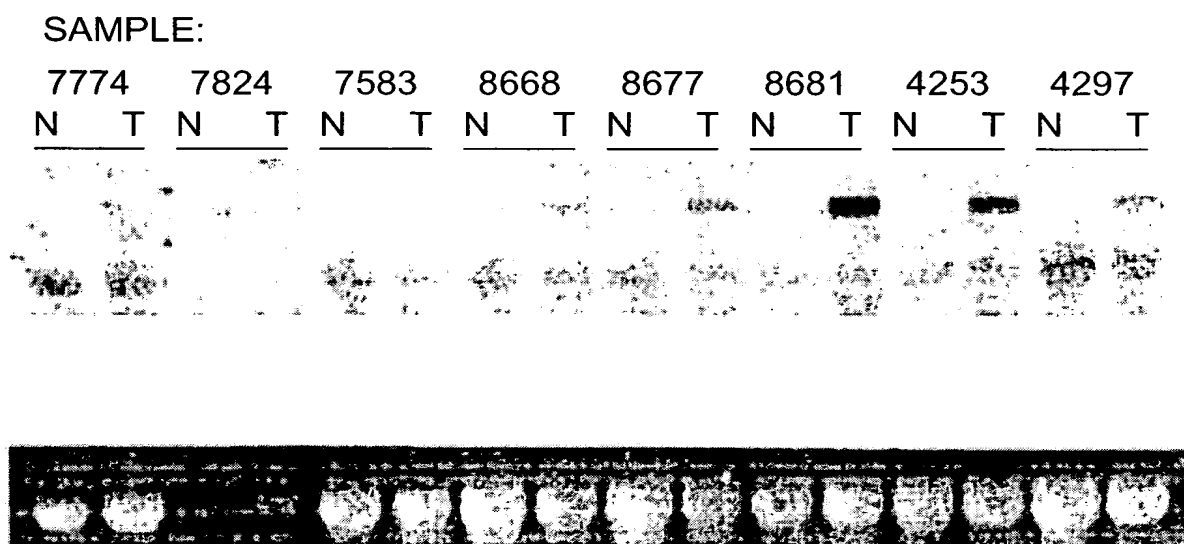


Fig. 29B

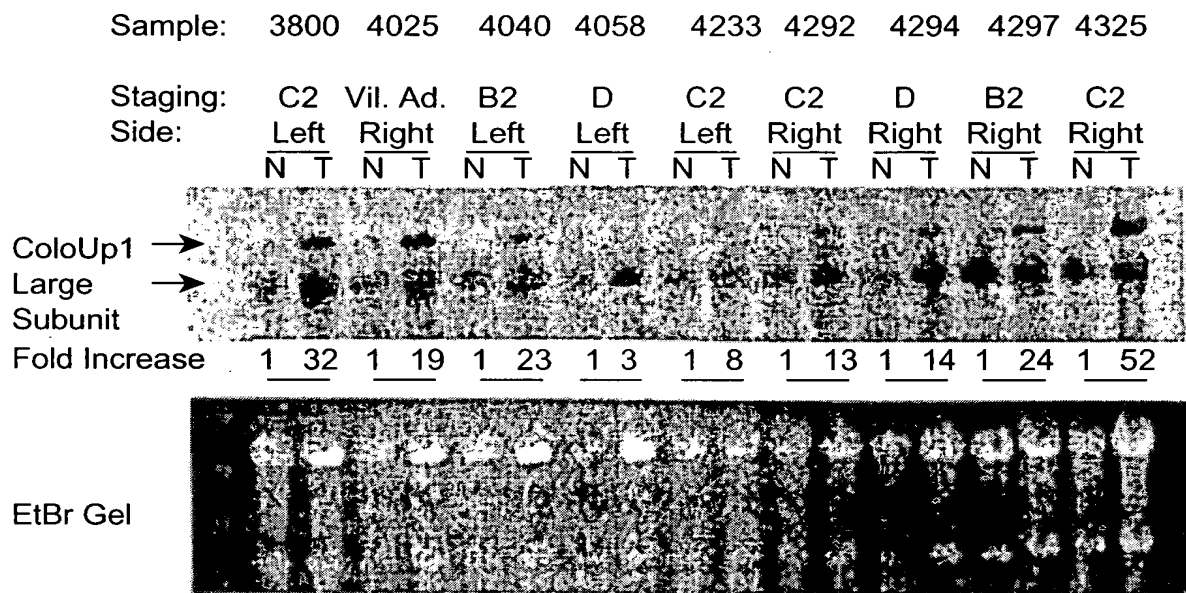


Fig. 29C

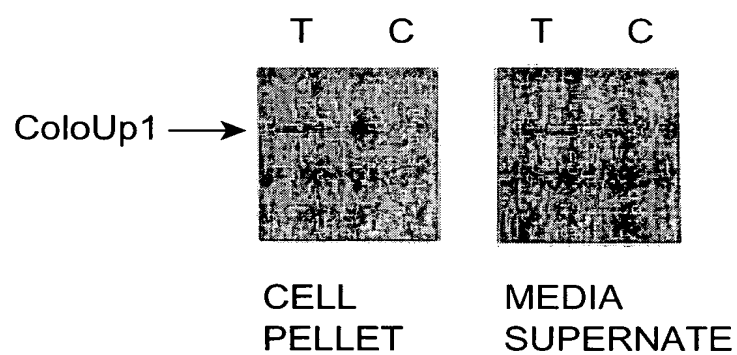


Fig. 30A

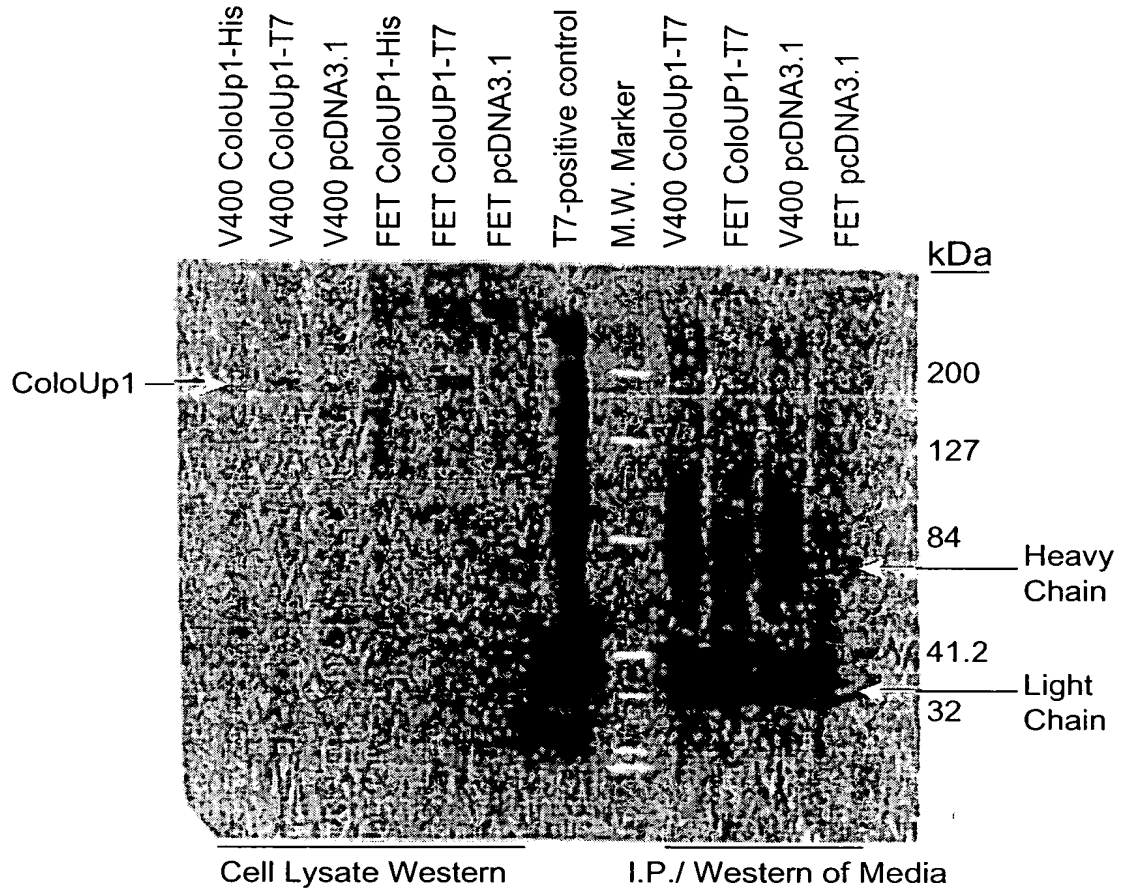


Fig. 30B

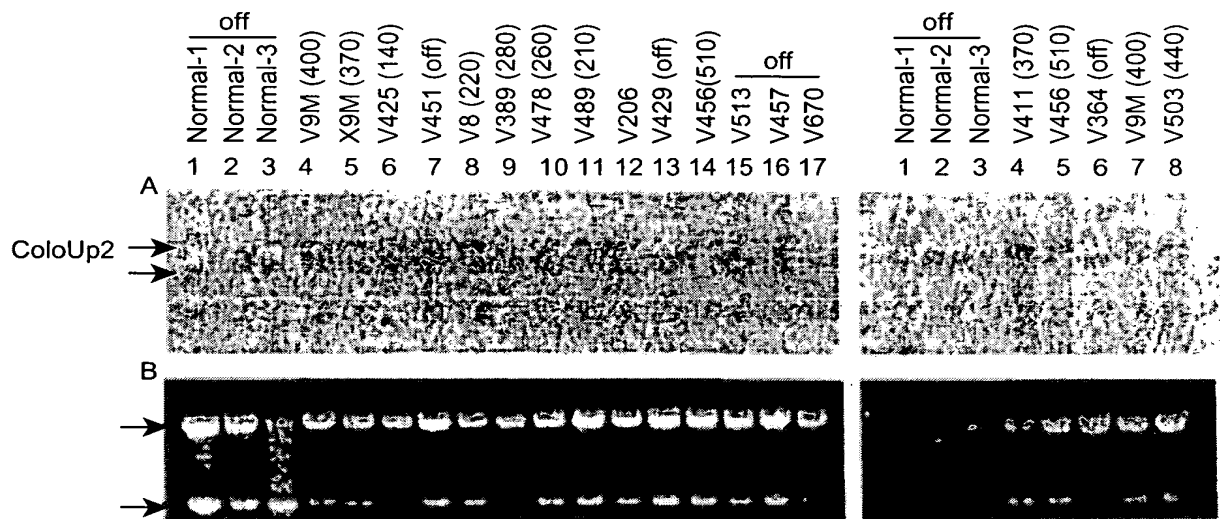


Fig. 31

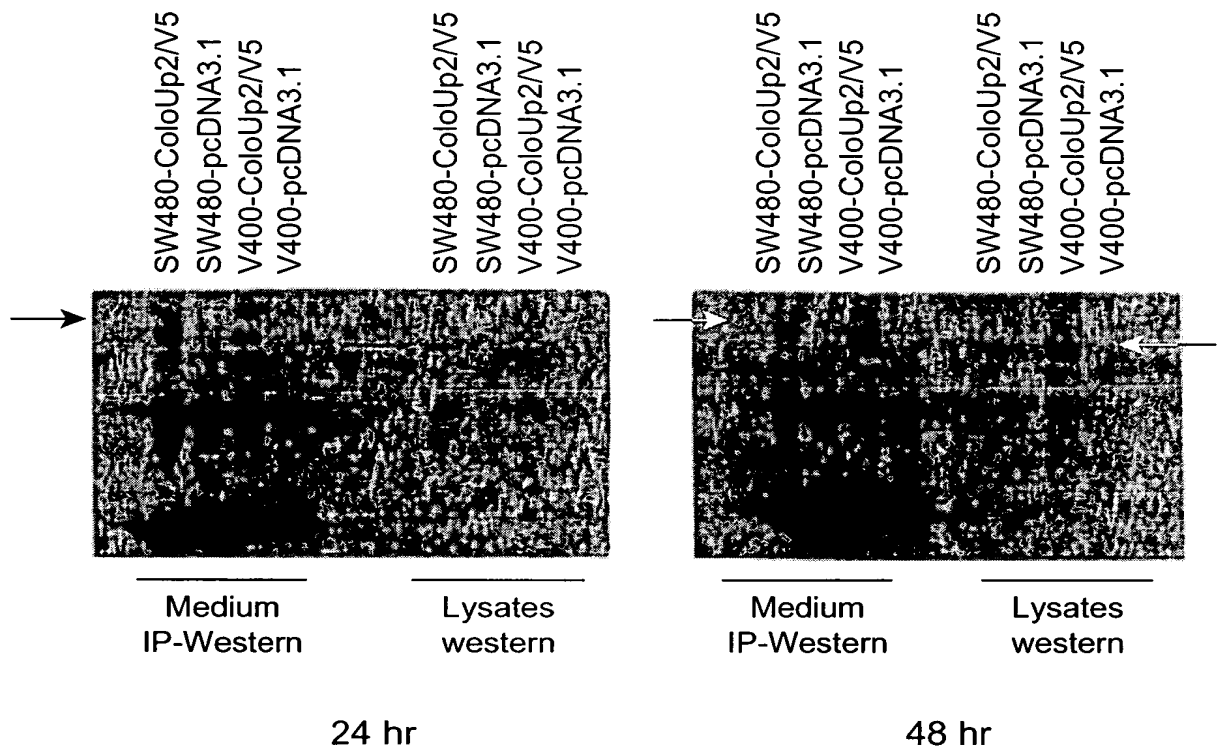


Fig. 32

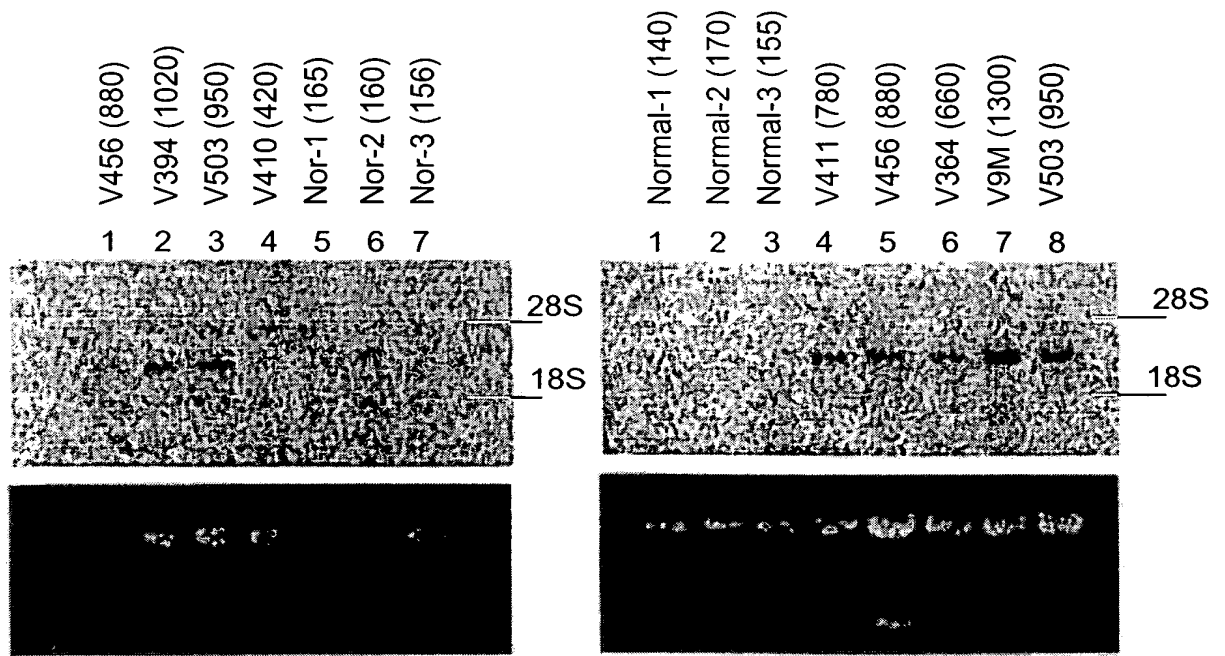


Fig. 33

Fig. 34

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Figure 35 displays a grid of 192 sequence logos, each representing a different human and mouse foxq1 gene. The logos are arranged in a 16x12 grid. Each logo shows the conservation of nucleotides (A, C, G, T) at various positions, with the y-axis representing the information content in bits. The x-axis represents the position in the sequence. The logos are labeled with their respective gene names and positions. The sequence logos are arranged in a grid, with each logo representing a different human and mouse foxq1 gene. The logos are arranged in a 16x12 grid. Each logo shows the conservation of nucleotides (A, C, G, T) at various positions, with the y-axis representing the information content in bits. The x-axis represents the position in the sequence. The logos are labeled with their respective gene names and positions.

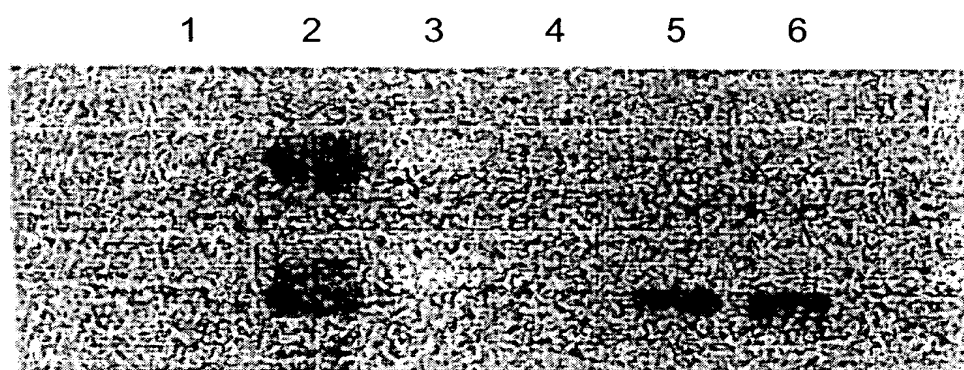


Fig. 36

1 2 3 4 5

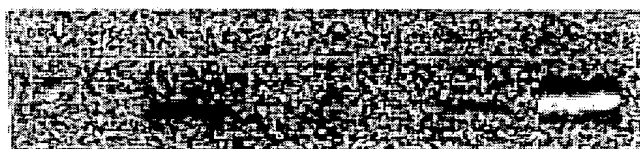


Fig. 37

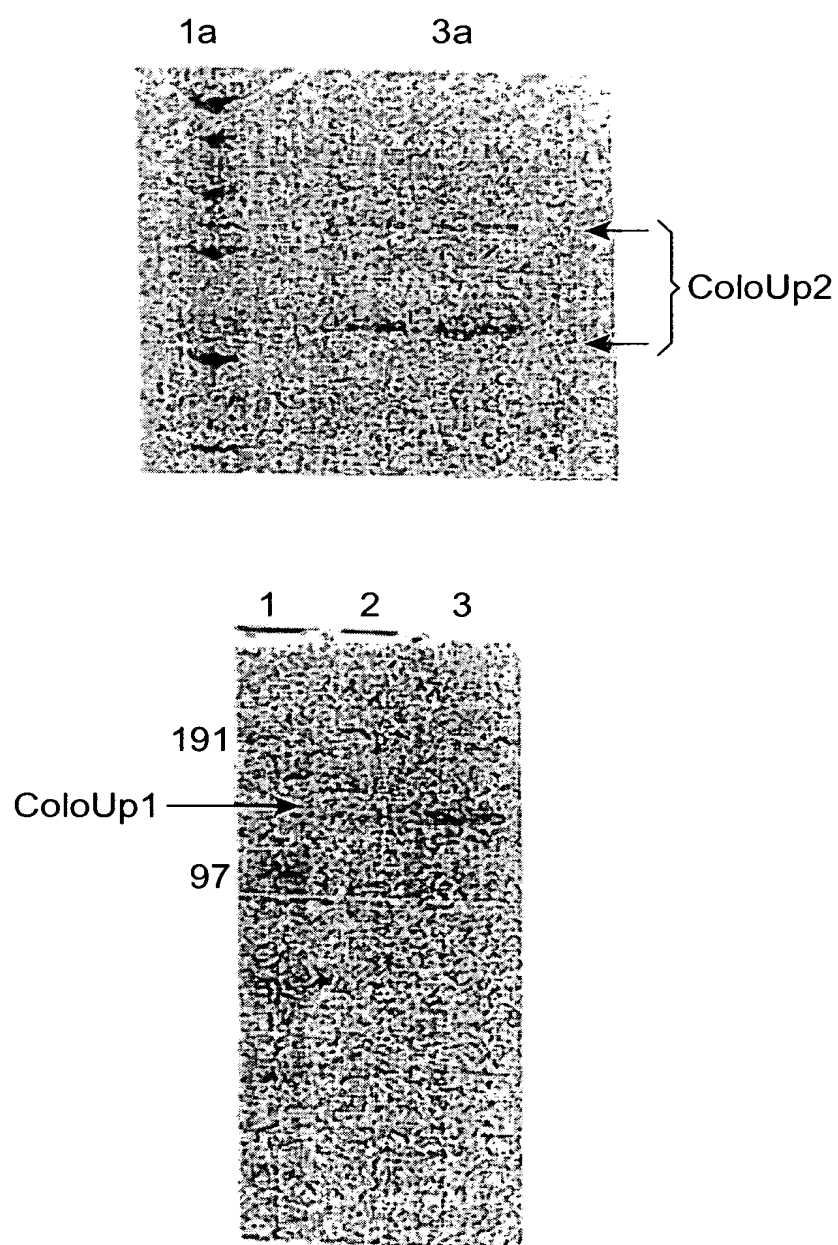
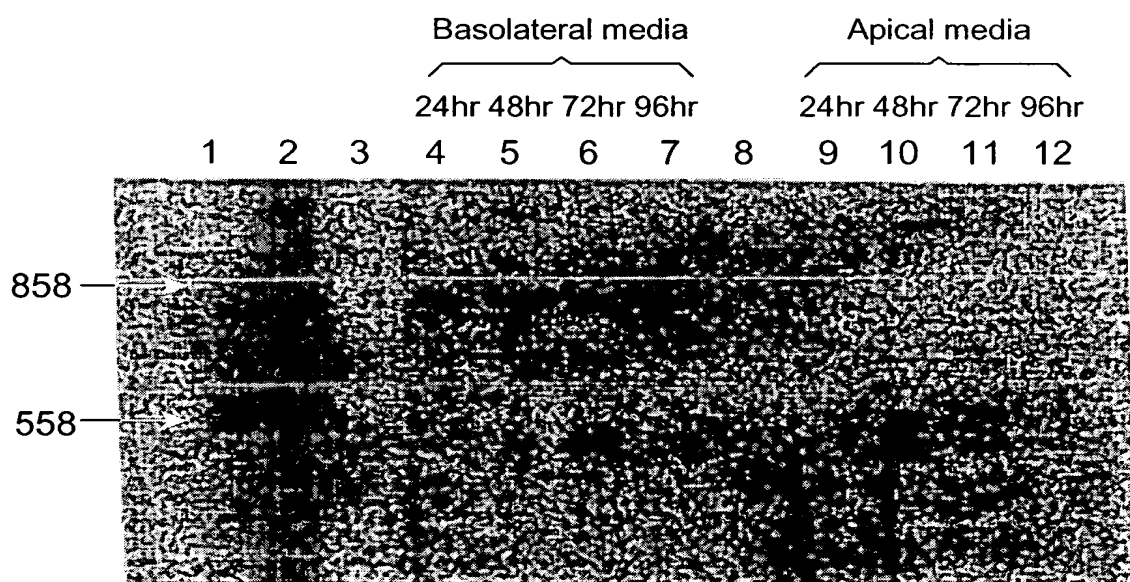
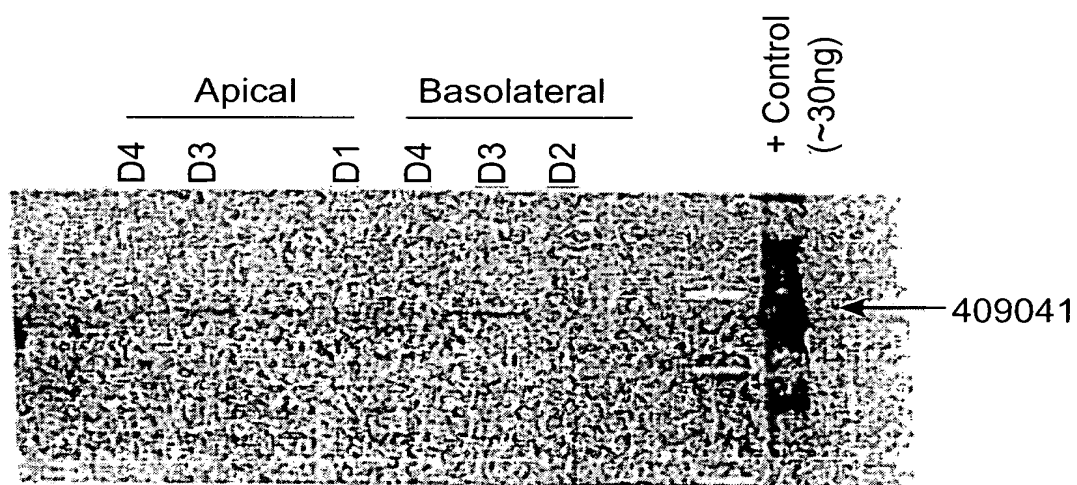


Fig. 38



time points (hr)	resistance	transfection efficiency
0	220	N/A
24	199	15%
48	184	25%
72	220	30%
96	214	30%

Fig. 39



Day	Resistance	% GFP Exp.
0	300	0
1	415	10
2	260	20
3	206	25
4	218	25

Fig. 40

AVLAAHCPFYSWKRVFLTHPATCYRTTCPFPPCDSQPCQNGGTCVPEGLDGYQCL
CPLAFGGGEANCALKLSLECRVDLLFLLDSSAGTLDGFLRAKVFVRRFVRAVVLSE
DSRARVGVATYSRELLVAVPVGEYQDVPDLVWSLDGIPFRGGPTLTGSALRQAA
ERGFSGSATRTGQDRPRRVVLLTESHSEDEVAGPARHARARELLLLGVGSWAVR
AELEEITGSPKHVMVYSDPQDLFNQIPELQGKLCSRQRP GCRTQALDLVFMLDTS
ASVG PENFAQM QS FVRSCALQFEVVNPDVTQVGLVVYGSQVQTFFGLDTKPTRA
AMLRAISQAPYLGGVGSAGTALLHIYDKVMTVQRGARPGV PKAVVVL TGGRGA
EDAAVPAQKLRNNGISVLVVG VGPLSEGLRRLAGPRDSL IHVAAYADLRYHQD
VLIEWLCGEAKQPVNLCKPSPCMNEGSCVLQNGSYRCKCRD GWEGPHCENRFL
RRP

Fig. 41
Amino Acid Sequence of a Secreted C-terminal Portion of ColoUp2
(SEQ ID NO:21)